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JOURNAL

VOLUME 17 NUMBER 12

DECEMBER 1951



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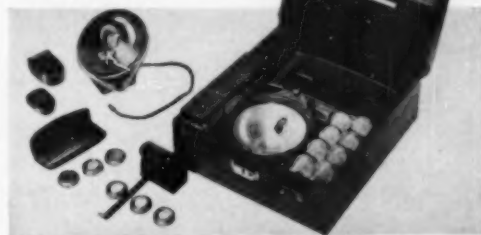
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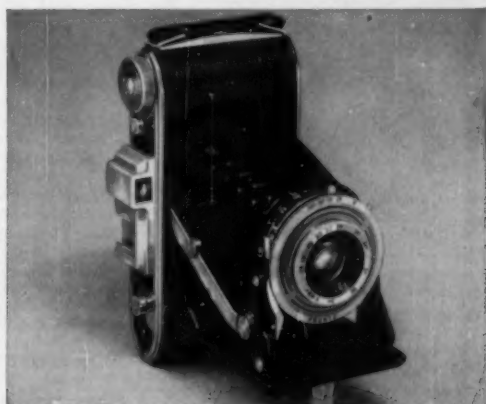
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THE PRESIDENT REPORTS . . .

Your letters since Detroit are most gratifying. First, they prove you liked the Detroit show and found it helpful while you enjoyed being with your friends again. Then there is the overwhelming evidence of your enthusiasm for PSA and its plans—a fact that promises much for PSA's future.

Perhaps half the letters suggest further steps for this or that project; the remainder request an assignment for some definite job; all add greatly to the peace of mind of the one who seems stuck with the job of getting the present plans into the stage of productive activity.

Those plans are rapidly developing in a number of directions. As you will note in the Board minutes, the by-laws have been amended to make Canada a separate PSA zone with its own elected Director and on a par in every way with the zones in the States. The amendment must have the approval of the Council, of course, but that is on the way. All the Board are delighted.

Those same Board members are also busily engaged in working out plans to expand local activity for PSA members all over the country. According to present ideas, the new setup will—I hope—result in many, many more regional conventions, one-day seminars, "Tops" shows and other exciting group activities that will result in "more from your membership," more general interest in everything photographic, and eventually more photographers sufficiently interested to become members of PSA. This can and will be accomplished without interfering in any way with the work of camera clubs; the desire is to help them in the job they are doing for photography and photographers.

It is a bit early to try to report on the work of John Hogan and his contest for the photographers who either do not wish to or are not yet ready to enter competitive exhibitions, but all the signs are for a general PSA activity that will offer much to the vast majority of our members.

Every one connected with PSA JOURNAL is quite happy over our having been able to get the report of Detroit into the November issue. We hope you liked it.

We hope too that you will like some of the innovations that will appear from time to time in the coming months. From here, it is impossible to say whether there may be fewer pages in a few of the forthcoming issues, but if we do drop down in size for a while, it will be temporary and we believe you will enjoy the difference in approach in several directions. Keep an eye on our JOURNAL and be sure to tell Harry Younan, the chairman of Publications Committee, what you think.

Our Service Medal

PSA honors are highly treasured—as they assuredly should be—but it is not often we can award one in such circumstances as those of the award of the PSA Service Medal to one of photography's hardest and most productive workers, Noble C. Ferguson, of Eastman Kodak's Editorial Service Bureau. It was at the luncheon given by the National Geographic Society in connection with the judging of the National Newspaper Awards at the Mayflower in Washington, and an occasion fitting both the Award and its recipient. This is just to thank Dr. Grosvenor and General Oscar Solbert for the compliment they paid both PSA and our long-time friend, Fergi.

The reason for this report is this: to call attention to large or small events in PSA planning and history as it is made, and to suggest your noting some of the important things PSA offers you. May I suggest that you go back to the October JOURNAL to page 637 where a list of some of the services and advantages of PSA starts. Read what Gene Chase tells about the PD services and then go on through the Johnny Appleseed article. When you finish memorizing them, you'll know more about PSA and why we all are members than you did—more than most PSA members did before that issue appeared. Remember it when you talk membership to that friend of yours—that photographer who should wear the PSA button. PSA is bigger and more valuable to any photographer than most of us know.

NORRIS HARKNESS, AFSA

PSA JOURNAL, Vol. 17, Dec. 1951

Great Christmas Ideas for Years of Picture-Making Pleasure!

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These famous cameras insure better pictures



SPEED GRAPHIC features governor-controlled, high-speed focal plane shutter, built-in flash sync., Graflok Back with Ektalite Field Lens. Crown Graphic is the same, but without focal plane shutter . . . and it costs less.



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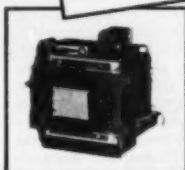
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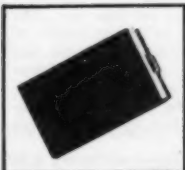
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GRAFLEX

Prize-Winning Cameras

New Aids for Better Picture Making

JACOB DESCHIN, APSA

Things move along so fast these days that what seemed a fantastic notion only yesterday is a practical reality today. The latest proof of this rather unoriginal, though apt, remark is a new enlarging light source for variable-contrast paper. Instead of having to use filters as now, the light itself changes color. The new medium, the parties to which cannot be mentioned for some reason having to do with some reason, is a fluorescent cold-light source that eliminates the need for the 1-to-10 blue and yellow-green filters now used, by mixing the color combinations within the light itself. You do it simply by moving a knob or lever to any one of ten contrast positions on a notched scale. I understand the new device will be available sometime next year, initially for 4x5, 5x7 or 8x10 enlargers, later for smaller machines.

I've seen the experimental model and watched it in action, and the results are all that could be desired, producing a gradual increase in image contrast from one change in the color of the light to the next.

The unit consists of a power pack separate from the lamphouse and connected to it by a cable; the 1-to-10 notched scale and the lever-knob control. For critical matching of prints, satisfactory results have been achieved by using intermediate positions between the numbers. The burning life of the cold cathode lamp is estimated at 6,000 to 8,000 hours, the wattage is 150, the effective power of the latter being four times that of ordinary tungsten light. The light output drops about 2 percent after the first 1,000 hours, then settles down to a uniform level throughout the rest of the lamp's burning life.

The lamp itself consists of two grid-shaped fluorescent tubes, one emitting pure blue light, the other pure green, the colors corresponding to the peaks of sensitivity of the currently available variable-contrast paper. Contrast is softest at the blue extreme (No. 1) of the scale, strongest at the green (No. 10) extreme, with variations in between. The purity of the two colors assures a high degree of accuracy and control, according to the inventors, who have patented the idea.

New Cameras

The Kinax Company line of French folding cameras has been announced by Raygram Corp., 145 East 32nd Street, New York, who are the exclusive distributors of this low-to-medium price line. All of the five models named by the company have a genuine leather covering, built-in synchronization, focusing by rotating the front lens element and take $2\frac{1}{4} \times 3\frac{1}{4}$ pictures on 620 rolls. The cameras are the Absace, with 100mm f/6.3 anastigmat and shutter speeds 1/15, 1/50, 1/100, and bulb, price \$28.75; the Provence 10V, with Berthiot 105mm f/4.5 lens and shutter speeds to 1/350, costing \$39.95; the Riviera, at \$49.95, similar to the Provence; the Ardennes, which has the Riviera features

but yields three picture sizes, $2\frac{1}{4} \times 3\frac{1}{4}$, $2\frac{1}{4} \times 2\frac{1}{4}$ and $1\frac{1}{2} \times 2\frac{1}{4}$ inches, at \$57.50; and the Normandy, which is like the Ardennes but has a Bellow f/3.5 lens and a special finder, at \$76.

The prewar Kodak Retina favorite is back as the Ila model of this 35mm German-made outfit. Imported by Eastman Kodak Company, the camera is equipped with the new Synchro-Compur shutter with speeds to 1/500th second; built-in flash synchronization for all flash lamps, and the new rapid film-advance lever. At \$168.50, the camera is about \$30 cheaper than the previous model. The camera also has a coupled range finder of the superimposed-image type, automatic shutter cocking and a new film counter.

Spiratone, 49 West 27th Street, New York 1, offer a new Japanese-made camera, "Million Proud" (different, to be sure, but hardly a name for a camera) at \$29.95, complete with an accessory rangefinder and leather everready case. The new camera, folding type, has an f/3.5 coated lens, double-action shutter speeds to 1/150th, built-in flash, and uses 120 film for 16 exposures.

Accessories

There's a new photoelectric exposure meter on the market, the "Mascot," General Electric's bid for the low price market in this field. Designed primarily for use with color film, still or movies, the meter sells for \$16.95 and is about the size of a match box, giving direct readings in lens stops for a shutter speed of 1/25th second. The instrument weighs $2\frac{1}{2}$ ounces, has a rotating scale for five A.S.A. film speed index numbers, 5, 10, 16 and 50, and is supplied with a scale selector to extend the range of direct camera settings. Its weight will appeal to the ladies, and its simplicity is calculated to attract the novice, but the need to multiply the fixed speed for shorter exposures may prove a little annoying until you get used to the idea.

Eastman Kodak has placed on the market the Kodak B-C Flashpack, a battery-condenser type flash unit designed to replace the flash batteries in any ordinary two-cell flash holder. The new \$2.95 unit consists of a condenser and resistor and uses a 22½-volt battery, which is not supplied, of the type used in such devices as hearing aids and miniature radios. The unit can be used in place of the batteries in any parallel or series-wired flash unit that takes two C batteries placed end to end.

A ten-cent pocket-sized Flash Slide-a-Guide, a simple flash calculator for instant determination of aperture setting, flash distance and shutter speed, has been placed in camera stores by Sylvania Electric Products, Inc.

Another flash item is Kalart Company's (Plainville, Conn.) new Focuscope, an accessory for the Kalart Range Finder. The Focuscope enlarges the focusing image to help in critical focusing. It is built with a

spring-loaded telescoping eyetube which permits the photographer to work closer to the eyepiece of the rangefinder. The Focuscope fits all late Model E (black) Kalart rangefinders, screws into the threaded eyepiece and may be left on permanently. Price \$2.95.

A new tripod line, Bower Tripods, is announced by Saul Bower, Inc., 114 Liberty Street, New York. The line consists of eleven German-made units in pocket and standard sizes. The pocket version may be had with or without tilt head in 7, 10 and 11-section models, measuring from 6½ to 10 inches closed, 44½ to 47½ inches extended, and costing \$11 to \$15.50. Made of aluminum, they are light in weight. Also available are five models in brass, two without tilt heads, three with head, and costing \$9.25 to \$15.50. Closed 15¼ to 18 inches, they extend to 49 to 61 inches. They have legs with double locking pins for added strength.

Two new lenses for 35mm cameras have been added. A 90mm f/1.8 coated Angenieux for the 35mm single-lens reflex Exakta camera is offered by Exakta Camera Company, 46 West 29th Street, New York. Contained in a lightweight mount with duplicate scales at top and bottom, this new French lens costs \$149.50. Spiratone, 49 West 27th Street, New York, has a coated 85mm f/2.8 and 135mm f/4.5 Steinheil Culminar Telephoto for the Contax S and Practica cameras. Either is \$69.95.

The Exakta people also have a new 2-in-1 Adapter Ring that is distinguished by the fact that it is the smallest extension ring made for the Exakta reflex, its actual extension being only 5mm. A bayonet mount on one side of the ring fits the camera opening and another mount on the other side fits the back lens mount. Price \$10.

A new "Scotch" item, No. 33 Electrical Tape, is Minnesota Mining and Manufacturing Company's gift to the fix-it-myself photographer who likes to do his own little jobs of mending. One use is to seal up bellows where they are beginning to show signs of wear and threaten to burst open. Wrap the tape around the bellows crease, the makers suggest, and when the worst happens, the tape will save the day. The tape is also useful in sealing bottles of developer and fixer, to secure loose lens boards to enlargers, and for sealing door and window cracks against light. No. 33, which adheres to the material upon contact, comes in 150-inch rolls of half-inch width at 39 cents.

For moviemakers Spiratone have a 1½-inch f/1.9 coated telephoto lens for 8mm D-mount cameras. In a chrome-finished brass focusing mount, the price is \$29.95. Other lenses in the company's 8mm line are a 1½-inch f/2.5 telephoto in focusing duraluminum mount at \$23.95; a 1½-inch f/3.2 telephoto in a focusing chrome brass mount at \$16.95, and, the lowest-priced lens in the line, a 1-inch f/3.5 fixed-focus telephoto at \$9.95.

This company also has a series of optical telephoto viewfinders for the Leica and Contax cameras. Priced at \$6.95, with leather case, the finders fit the camera's

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accessory clip, are chromium finished, have parallax correction, and are available in 75mm, 85mm, 90mm, 110mm and 135mm focal lengths.

The Omega D-2 enlarger may now be fitted with the new Omegalite diffusion head, which may be used on the enlarger interchangeably with the regular condenser unit. Purchasers of the enlarger may now buy the famous machine with either one head or the other, or both. The Omegalite head is a self-contained unit and costs \$42.75 plus \$7.13 tax. The price of the Omega D-2 with the Omegalite head is \$159.42 plus \$26.57 tax. The Omegalite, the pride and joy of Simmon Brothers, Inc., 30-28 Starr Avenue, Long Island City, N. Y., houses a Circline fluorescent lamp in an "integrating sphere," the inside of which is coated with a special reflective paint which causes multiple reflection of the light before it passes through the negative. The Circline tube is made by General Electric, has a rated life of 1,000 hours and may be replaced for \$2.25 plus 23 cents tax.

Raygram, 145 East 32nd Street, New York 16, distributors, send the news that Projectograph Corp., makers of the Projectograph Continuous Slide Viewer, are now marketing a table model. The 9x11-inch screen, they say, permits viewing at practically any angle. The viewer has removable reels, each holding fourteen 35mm Ready mounts, is motor-driven and changes slides at 12-second intervals, operating at a cool temperature. Illumination is provided by a 50-watt 6-volt bulb. Self-contained in a leatherette case with a matching cover for the screen, the viewer costs \$129.50.

From Eastman Kodak comes enthusiastic intelligence concerning two new enlarging papers and a new paper surface. The papers are Kodak Medalist (no relation to the camera) Paper, in contrasts 1 to 4, the principle feature of which is its new type exposure and development latitude; and Kodak Ektalure Paper, a portrait type enlarging paper in the G surface with a printing speed more than twice that of Kodak Opal. Medalist will be available in the F surface, the G and the new surface J, which is a double-weight paper that is smooth, white and has a high lustre. Medalist gets along fine with a number of standard toners and has a speed equivalent to that of Kodabromide Paper but is inherently somewhat warmer. The exposure, says Kodak, is approximately the same for all contrasts. Ektalure tones well in the selenium or gold toners and has a surface particularly suitable for applying oil colors.

Kodak also announces that the price of Kodacolor negatives made from 35mm and Bantam size Kodachrome transparencies

has been cut from 40 cents to 25. This will bring the cost of the first Kodacolor print made from any miniature Kodachrome transparency down to 61 cents. Subsequent prints will continue to be 36 cents each.

And if you want something real easy in the way of photographic know-how for beginners, you can't do better than Kodak's new booklet, "Photo Tips for Simple Cameras." The price is 25 cents and worth every penny. Prepared for "people in a hurry" it has lots of good pictures, many swell ideas, and *brief—but brief*—technical instructions, giving just the right amount of information people in a hurry might want.

The recent 1951 photographic trade show held in beautiful San Francisco by the Master Photo Dealers' and Finishers' Association turned up a brace of new cameras, foreign and domestic, in the still, motion picture and stereo fields. Also, it signaled Eastman Kodak's entry into the flash synchronizer design field.

Kodak's bid for the flash user's favor came in the form of the Kodak Ektalux Flashholder, a new flash synchronizer that provides, with accessories, an integrated system of flash photography. It was the latest and most comprehensive contribution to the field of the battery-capacitor-type flash units that are now rapidly supplanting ordinary flashlight battery guns.

Designed primarily for the advanced amateur and professional, the Flashholder of the Ektalux is shaped for a convenient hand-grip and contains a power pack that takes either one or two of the small 22½-volt batteries used in the battery-capacitor system. The Flashholder can be fitted to any press, professional or better-grade amateur camera, and comes packaged complete with a mounting bracket and a plug-in cord for the flash shutter. When the batteries are added by separate purchase, the unit is ready for operation. Depending on the camera, the cost of the outfit ranges from \$34.75 to \$39.50. An Ektalux extension unit, with 20-foot bayonet connecting cord, is \$14.50.

The overall plan of the Ektalux System, to keep equipment to a minimum yet maintain complete flexibility for all flash uses, is achieved in a design that permits all parts to be readily disassembled and packed in a small kit bag. Reflectors can be nested and extension units are molded to fit snugly against each other. The Flashholder, which is made of magnesium casting and weighs less than two pounds, is adjustable for Class M or F flash lamps, and has five marked inputs, for the flash shutter cord, solenoid cord, two extension cords, and remote control. An accessory Ektalux Solenoid is offered for use in remote control flash operation, as in nature photography, at a distance of twenty feet from the camera.

The main unit and the extensions, which are series-wired, take either midjet or medium screw base lamps without adaptors. An ingenious device is used to focus the midjet lamp for normal light spread or wide flat coverage. The Ektalux reflector is a parabolic type, on the back of

PSA TRADING POST

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For Sale—Weston Densitometer and 7" f/2.5 Aero-Ektar in Pacemaker Graphic lensboard, \$50 each. George J. Stiles, 3227 Millford Ave., Baltimore 7, Maryland.

which is printed a complete exposure guide for black-and-white and color. The reflectors are slotted for quick attachment or removal from the holder. The press bracket can be instantly detached for holding away from the camera.

The cameras at the show were highlighted by an improved new Polaroid picture-in-a-minute camera model that will sell for around \$200 and the View-Master Personal Stereo Camera, the price of which will be under \$150. Both cameras will be available early in 1952.

A pre-production model No. 110 of the Polaroid shown uses the same body as the present Model No. 95 but incorporates a better lens and shutter and has a coupled rangefinder. The lens is the 5-inch Wollensak Raptar f/4.5, the shutter is a Wollensak Rapax with speeds to 1/400th, and the coupled rangefinder is a Kalart. The camera also has a telescopic viewfinder and built-in flash for both M and X-type flash units. In the Graflex company's booth, a Polaroid Land Back was introduced as a new accessory for the 4x5 Crown or Speed Graphics with Graflok back. This special unit, designed for occasional use and interchangeable with the conventional film holder, utilizes the regular Land camera body and costs \$77.50.

The View-Master stereo camera is designed to take the familiar View-Master split 35mm film size by an ingenious shifting of the matched 25mm f/3.5 lenses. This device makes possible a picture yield of thirty-seven of the small stereo pairs on a twenty-exposure roll and sixty-nine on a thirty-six-exposure roll. The guillotine-type shutter has speeds from 1/10 to 1/100. A die-punch film cutter for punching and orienting stereo pairs to fit the viewing reels will be offered as an accessory at around \$15. A range-finding flash unit attachment also will be available.

A 2½ x 3¼ model of the Linhof Super Technika was displayed by Kling Photo Supply Corporation, 235 Fourth Ave., New York. In addition to many features of the larger model, the smaller camera has a single cam plate for three focal lengths of lenses, a focusing scale positioned near the finder eyepiece, two-position body release and handsome styling. The new model will cost \$550 with three lenses in fully synchronized Compur Rapid shutter. The lenses are Schneider Xenars 105mm and 180mm and the 65mm wide-angle Angulon.

A new accessory reflex housing for the Voigtlander Prominent 35mm camera was announced by Willoughby's, 110 West 32nd Street, New York. The \$225 camera with f/2 Ultrons lens is now available for the first time since its announcement some months ago. The housing provides for

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eye-level or reflex viewing, has a special type frame finder, and is equipped with a 4-inch f/5.5 telephoto lens that can be increased to six inches merely by adding an element to the front of the lens. In use, the regular camera lens is removed and the \$165 housing assembly is substituted. Willoughby's also showed two accessories for the Hasselblad single-lens reflex camera, a \$480 Zeiss Sonnar 10-inch f/4 lens and a \$28.50 sports finder with built-in contacts for flash and strobe.

Several manufacturers offered various versions of the popular camera kit as a gift idea. Kits were shown with Ansco, Beacon, Argus, Kodak and Reflex II inexpensive cameras. Ansco had three kits. The Readyflash outfit, at \$15.95, included the new \$6.45 camera for 620 rollfilm, a flash attachment with batteries, six flash lamps, a portrait attachment, the new Ansco \$6.95 gadget bag, and two rolls of film. The camera is not available separately. The Ansco Rediflex camera outfit, at \$24.95, contains the \$12.95 camera, and an eveready case in addition to the items in the Readyflash kit. The Ansco Flash Clipper outfit, at \$26.95, includes all the items mentioned except the portrait attachment. The Clipper alone, which uses 616 film, is \$14.85. The kit price in each case is about \$5 less than the cost of the items if purchased separately.

The Beacon Holiday Pack, which costs \$25.95, consists of the Beacon 225, which takes twelve pictures on a 620 roll, flash

attachment, carrying case, four flash lamps, batteries and film. With the Beacon II, using 127 rollfilm for sixteen pictures, and the same items, the pack costs \$19.95. The \$24.95 Argus Gift Kit contains the \$15.95 Argoflex 75, flash attachment, eveready case, batteries and film. The Reflex II kit contains the \$9.95 camera, flash attachment, leather kit bag, flash lamps, batteries and film.

Kodak displayed three kits. The \$13.75 Brownie Hawkeye Flash Outfit includes the \$7.45 camera, Kodalite Flashholder with two-way Flashguard, flash lamps, batteries and film. The \$29.25 Kodak Duaflex Flash Outfit contains the \$22.95 Duaflex II camera with Kodar f/8 lens, plus the other items. The \$55 Kodak Pony Camera Outfit contains the \$32 Pony 828, leather field case, and the other items.

Revere Camera Company of Chicago showed a new model of the Revere Recorder, the deluxe long-playing T-500 model priced at \$179.50. The recorder uses the regular 5-inch reel of magnetic tape, but the operating speed has been slowed down to permit an hour's recording on each side instead of a half hour, as in the previous model. The company also had a Divaerial printing kit, the EK-220, which costs \$10 and includes chemicals, trays, measuring cups, paper, sponge, easel, special darkroom lamp and instructions for working the Divaerial process of making enlarged monochrome prints directly from color transparencies. In anticipation of possible photographic shortages, Revere offered dealers two fill-in hobby items. One is a hobbyist's grinding set, the other a drill, both Revere-Omatic. The set comes complete with a 1/4-inch grinder and about thirty assorted tools at \$29.95; the drill is 1/4-inch and costs \$39.50.

The new TDC Project-or-View, a combination projector and table viewer for 2x2 slides, was shown by Three Dimension Company, 4555 W. Addison Street, Chicago. The device has a 6 3/4-inch-square viewing surface for table viewing and is quickly convertible for screen projection to a 40-inch screen from a distance of eight feet. The projector-viewer is equipped with an f/2.9 projection lens and is available in two models, one with a 150-watt lamp, convection cooling, for AC, DC operation, at \$69.50; the other, with a 200-watt lamp, blower-cooled, for AC only, is \$79.50.

Graflex showed a new \$34.95 Graphic all-metal, three-section tripod, which is light in weight but sturdy, has a center post for increasing the tripod's fifty-inch extension to sixty-two inches, and is equipped with a pan-tilt head. The center post can be reversed for operating the camera from low levels.

Polaroid introduced a plastic coating stick for application to the surface of Land camera prints in order to protect them from damage in handling. The plastic will be included with every package of Polaroid film. Camera bags and cases made with a new type leather, Sonoma saddle leather, were displayed by J. B. Perrin Company, of Culver City, makers of the popular line of Pro-Bags.

LETTERS TO THE EDITOR

Rochester, New York

TO THE EDITOR:

The monthly publishing of an "Exhibition Listing" in the PSA JOURNAL is an excellent idea which has met with considerable approval among the contemporary exhibitors. Surely there are others, who, like ourselves, have long felt that these and other statistics pertinent to pictorial photographers should be under the supervision of PSA.

The "PSA Minimum Requirements for National or International Print Exhibitions," as published in the May 1951, directory issue of the JOURNAL, do not specify that a particular number of prints should be accepted to obtain PSA recognition. However, in actual practice, only those salons accepting one hundred twenty-five (125) or more prints have been recognized for the Exhibition Listing. This practice is not in accordance with the official Minimum Requirements.

We, the undersigned Rochester exhibitors, feel that PSA has little or no basis for perpetuating this arbitrary number of acceptances as a criterion for recognition. It tends to be detrimental to pictorial photography, particularly in the case of the small salon.

Even in a large salon receiving 1,000 or more prints, there is a possibility that less than 125 prints may be accepted if mediocre print quality and uncompromising principles of the judges were to exist simultaneously. A similar situation is even more likely to occur in a smaller salon receiving 500 or less prints. Both, while attempting to maintain high standards, are forced to suffer the unfortunate repercussions of non-recognition.

It is our suggestion that PSA recognize all salons endeavoring to follow the PSA Minimum Requirements as they exist in their present form. Should a quantity requirement be considered necessary, then let us propose that it apply only to the total number of prints received. This, in turn, gives the Jury of Selection the sole right and privilege of determining the number of prints to be accepted.

JOHN I. FISH
ROBERT F. EDGERTON
GRANT M. HALST
LAWRENCE M. SPAVEN
LOWELL MILLER
CHARLES W. FAIRBANKS

Hempstead, L. I., N. Y.

TO THE EDITOR:

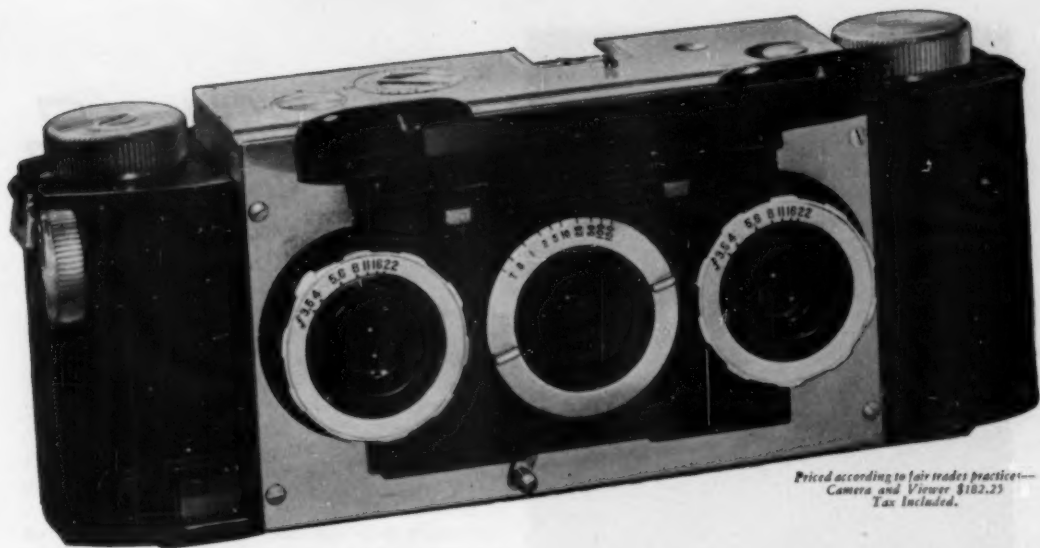
I thought the article "Clouds for the Photographer" by Gerda Peterich in the September issue of the JOURNAL an interesting approach to the subject, an approach of greater depth than is usually found.

EDNA SCHNEIDER

PSA CONVENTION

New York, New York, August 13-16, 1952

PSA JOURNAL, Vol. 17, Dec. 1951



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SHADOW PATTERN

John Erith

Harmonious arrangement of elements, or composition, can contribute as greatly as light, shade, and subject to the overall impression created by a photograph. Actually, there is no movement in the subject matter of this picture. Yet the long shadows of the gate suggest the setting sun, and this suggested action expands the idea of "Time Flies" stated by the sign.

GIVEN the necessary natural aptitude, any amateur photographer can make pictorial photographs of merit. Initial efforts may be somewhat below present exhibition standards, both technically and artistically, but the work will improve with the development of artistic perception. And the start may be made, preferably, with a simple, inexpensive camera which will enable the photographer to devote his attention to making pictorial photographs instead of becoming involved in complications with gadgets and technical difficulties beyond the range of his experience.

Admittedly, it is difficult, even in the case of the beginner, to define where pictorialism begins and ends. The transition from purely factual record often is subtle. The exact limits within the range of the medium are undefinable. In large degree, the individual is the factor.

Selection of the type of subject-matter is determined by the photographer's own interests. Approach to subject-matter depends upon the degree of his perception and the quality of his artistic gifts. Chief attraction for some may be the camera's ability to depict the pictorial possibilities of the everyday human scene. Others may prefer to record the beauty of Nature in her varied aspects, or to photograph wild animals and birds in their natural haunts. Some workers will be fascinated by the dramatic movements of subjects in action. Still others

So You Want To

A FEATURE BY

are drawn to the industrial scene with its impressive powerplants, machines, locomotives, cranes, steamships—all contrasted with the pigmy humans who control them. The natural choice of many may be the revelation of character through portraiture. Some will prefer the glamor of the theatre or ballet. All these subjects have 101 different aspects. The possible variations are endless.

Selecting the Camera

Since the term "pictorial" is applied to work of no one particular kind, and is limited to no one field, no one type of camera is most suitable. Choice of camera must be determined by that type of pictorial work in which the photographer chiefly is interested.

For the majority of serious amateurs, a well-designed $2\frac{1}{4} \times 2\frac{1}{4}$ precision instrument with a first-class lens has much to recommend it. The camera may be either of the coupled-rangefinder or reflex type. Unless one is shooting fast-action in poor light, it is unnecessary to buy an expensive lens faster than $f/3.5$ in these days of fast emulsions. With flash bulbs, movement can be arrested with lenses which are "slow." It is better to buy a camera fitted with a first-class lens of modest aperture than a fast lens of inferior quality.

The user of the $2\frac{1}{4} \times 2\frac{1}{4}$ is less likely to need to encumber himself with a battery of lenses of varying focal lengths than is the user of the 35mm camera. Owing to the small film, the operator of the miniature must be careful to fill his frame with the exact amount of subject-matter he wishes reproduced in the finished print. However, the 35mm camera has the advantage of greater flexibility, enabling an expert user to attempt a wider range of subjects than is possible with any other one camera.

The photographer working with the $2\frac{1}{4} \times 2\frac{1}{4}$ camera has more leeway. He need not fill his frame with the exact amount of subject-matter desired, a fact which may enable the photographer to work more quickly. Also, it allows greater latitude for subsequent minor alterations in composition, particularly as to the portion of subject-matter, and its proportion, used in the final print.

The choice between rangefinder and reflex cameras is largely a matter of personal preference. Both types are widely and well used; each has advantages and disadvantages.

How To Make Artistic

Be a Pictorialist!*

JOHN ERITH, FIBP, FRPS

The single-lens, or direct, reflex is suited to those occasions calling for lenses of longer focal length than the standard 7.5cm. The twin-lens reflex offers the advantage of maintaining the bright illumination of the image on the focussing screen, even when the taking lens is stopped down. Twin-lens reflexes customarily are fitted with Compur shutters; direct reflexes with focal-plane shutters. Sometimes the focal-plane shutter-mechanisms leave much to be desired, mechanically-speaking.

Recently, several camera designers have undertaken to combine the advantages of coupled rangefinder and reflex in one camera. This development offers many advantages, particularly for those who prefer the small camera for pictorial work.

View Cameras

It is wise for any photographer to master the use of a simple camera before using the expensive and complicated instruments. Perhaps an intermediate stage best is devoted to learning the use of the view camera. The experience will teach the value of certain movements lacking in small cameras, and will bring home the need of avoiding wastage of material through faulty technique or hit-or-miss methods.

Color

When working with color, choice of camera is determined by the process employed. The 35mm camera can be used to produce transparencies for projection. For those who intend to make color prints by the separation-negative method, the $2\frac{1}{4} \times 2\frac{1}{4}$ camera is the absolute minimum. In fact, for the production of direct separation negatives, the $3\frac{1}{4} \times 4\frac{1}{4}$ is the smallest practical size.

Exposure Meters

Photo-electric exposure meters are adjuncts rather than substitutes for judgment of exposure. Photographers inclined to believe that the meter is a fool-proof instrument for the automatic determination of correct exposure for any type of subject without independent judgment on the part of the operator are likely to find results unsatisfactory. Many experienced photographers rely upon judgment to estimate exposure, using a meter only under unusual or difficult conditions.

Development of judgment, of course, comes with experience over a prolonged period of constant practice.

Pictures of Quality



BLAST FURNACE

Harold White

Ugliness of structure or outline possesses strange beauty. This photographer has made an ugly machine impressive, first by stressing the irregular outline and then by contrasting the structure with the relatively diminutive humans.

Sooner or later the stage is reached when one can draw upon data stored in the subconscious mind, automatically making allowance for variations in each factor without thinking the matter out. To this end, it is wise for beginning photographers to keep detailed notes of the conditions under which each exposure was made, and in this way learn to recognize the influence of variable factors.

Subject-Matter

Because of the fact that familiarity with everyday environment tends to dull both perception and appreciation, it is nearly always easier for the inexperienced to find material for pictorial photographs in other than the immediate area of their daily routine. Beginning pictorialists should concentrate first upon photographing less familiar places. Their minds will be more receptive to impressions. Later, when perception has developed, they will be rewarded by the discovery of beauty under their noses!

Beginners with pictorial aspirations usually start by

* Based upon the book, "Erith on Pictorial Photography," published by The Fountain Press, London, with the permission of the publishers. Available postpaid from PSA JOURNAL, Kutztown, Pa., price \$6.50.

photographing inherently picturesque subjects. These are difficult to miss. They include such subjects as old-world cottages, village churches, horses plowing, cows browsing, swans, ruined buildings, windmills, sailboats, sunsets, and woods carpeted with flowers. The resulting pictures invariably are no more than simple records showing little or no evidence of artistic perception. Fact of the matter is that it is more difficult to produce original and effective works from inherently picturesque subjects than from less hackneyed material. However, the beginner's prediction for photographing the picturesque is a training period. It leads to awakening realization of the effects of lighting, viewpoint, and color.

There is no occasion for rejecting material merely because it is picturesque. Some of the world's greatest artists have created masterpieces from just such material. Their genius, however, enabled them to present an entirely new conception of the subject. Constable and van Gogh painted country landscapes which could have been commonplace, or just "pretty-pretty." Their works are unique, not merely in the individuality of interpretation, but also in the creative approach to the subject-matter.

There is, however, one important qualification. The photograph being tied to factual representation, pre-eminence is most likely to be achieved in the treatment of subjects which lend themselves less to emotional interpretation than to the exploitation of distinctive photographic

qualities. Although this conclusion may appear to favor the choice of inherently picturesque subjects, the exact opposite actually is the case. The distinctive qualities of photography are: producing exact factual records with facility; reproduction of detail, texture, and subtle gradations of tone; recording action without loss of these qualities.

If more photographers would compare the relative qualities of freehand and photographic pictures, depending upon the exercise of their own intelligence rather than upon the opinions of their fellows, the prestige of pictorial photography soon would be considerably enhanced. The assumption that the choice of suitable subject-matter is of primary importance to the pictorial photographer shows that those who complain of handicap in this respect have hold of the right stick, but are grasping it at the wrong end. The camera being a recording instrument, it is obviously necessary to point it at something having pictorial possibilities. But it is not so much the subject as the way the photographer handles it that counts.

The Broader Pictorialism

Question often is raised that, since the term "pictorial" is not, or should not be, limited to photographs of one particular type, nor confined to work within a narrow field, what possibilities await the photographer with the broader outlook.

Pleasure from photography may be divided into four categories: Sentimental pleasure; pleasure in surprise; emotional pleasure; and pleasure through application. Sentimental pleasure derives from pictures of familiar things and scenes, from scenes and subjects which are inherently picturesque, and from attractive human and animal subjects. Photographs of good technical quality may be merely record pictures of these sentimental subjects, whereas, if these subjects be photographed with true artistic perception, so that the feeling of pleasure aroused by the pictures is due primarily to the successful exercise of creative ability through the selective arrangement of subject-matter, the pictures can have genuine artistic value.

Unfamiliar or humorous subject-matter affords pleasure in surprise, either because scenes and subjects are new and strange, or scenes, subjects, and situations appeal to the sense of humor. Again the record picture may have good technical quality, while the work of art has employed creative ability, originality, selection, and arrangement to give pictorial qualities to scenes and subjects which may themselves be lacking in pictorial possibilities, be uninteresting, or be even downright ugly.

Pleasure through application may be found in making pictures of subjects which offer no scope for the exercise of artistic perception, but are made for scientific or other useful purposes. However, due to the inherent beauty of the subject-matter, such as crystal formations, even such pictures may be pictorial, if accidentally. On the other hand, there are subjects photographed for specialized purposes which allow considerable scope for originality of presentation and artistic perception. The work



MATTERHORN

John Erith

Shapes can be as intriguing as subjects. This picture's charm may be ascribed largely to balance between dissimilar shapes. The delicately intricate tracery of leaves and branches in the foreground is contrasted with the ruggedly simple outlines of the mountains in the distance. And a beautiful evening sky makes an appropriate background.

of illustrative photographers is an example. Their influence already has brought about a revolutionary change of outlook in pictorialism.

Emotional pleasure is derived from photographs which incorporate mood, shapes, textures, patterns, balance, and harmony. Some photographs are capable of producing sensual or sadistic pleasure, including those which permit exploitation of the sex motif. The photograph as a medium for representation of the unclothed or partly-unclothed figure has many and obvious shortcomings. The greatest care is needed to avoid overstepping the borderline of good taste.

Composition

In making pictures in any medium, there are certain principles which need to be understood. These principles are included under the term "composition." They are *not* rigid rules applied dispassionately to the creation of new works of art. When composition is applied by rule of thumb, de-composition sets in.

The highly-gifted artist does not need to "learn" composition in the generally accepted sense because he has an instinctive sense of the "rightness" to prompt him when inspired under emotional stimulus. His work will be found to conform to certain principles applicable to all pictures of artistic merit. Many people possess a natural instinct for composition. That is why certain pictorial photographers are able to produce well-composed pictures on occasion without a knowledge of theory, whereas others are incapable of applying their knowledge of composition to any good purpose.

The study of composition is extremely valuable to the majority. In this way it is possible to acquire some of the intuitive knowledge given to the artist born with pronounced gifts. Thereby the student is enabled to draw upon the accumulated experience of those who have studied the works of great artists, and can thus avoid certain errors, as well as judge faults in their own work. Workers without this training may feel that something is wrong with a picture, but cannot diagnose the trouble.

The student needs this background just as he needs to master the technical side of his medium—so that he may draw upon it subconsciously. Indeed, a knowledge of the theory of composition is likely to be of real value only when it has been learned and forgotten by the conscious mind, and has become part of the instinctive feeling of "rightness" already possessed to a limited degree.

Pictorial Difficulties

Although modern photographic processes may be easier to learn and to handle than those of an earlier day, comparatively few workers succeed in producing work of consistently flawless technical quality. There are many contributory causes.

Perhaps the chief pitfall is the ease with which it is possible to produce pictures satisfactory to the uncritical. Many workers never put their pictures to the test of portfolio criticism or of salon competition. The second contributory cause of poor technical quality may be

over-reliance upon text-book method. Many books give the impression that all that is needed is an understanding of the underlying principles and the correct method of application, whereas "book learning" is only the beginning. It must be supplemented by judgment based upon experience.

For instance, the human eye is by no means reliable as a recording instrument. Nor does the human mind record impressions with scientific accuracy. Yet in most photographic work the photographer has to rely upon his visual impression, and there is no scientific instrument which adequately can replace it.

The photographer must learn to perform the various operations in the right way. Also he must train his mind to observe correctly what is seen with his eyes and then translate his impression into terms of the photographic material employed so that he sees subject-matter not as the eyes see it but as it is seen by the camera and negative and processes which make it into a finished print.

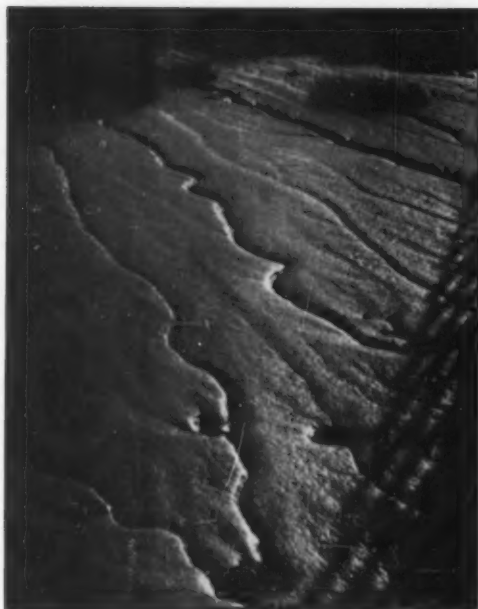
The photographer can be said to have acquired technical competency only when he can draw upon data stored in his subconscious mind, making allowance for variations in each factor in such a way that he can determine just what will be needed at each stage, from exposure of the negative to completion of the finished print. Only constant practice, observation, and experience over a long period can bring success. There are no short cuts.



WATER LILY LEAVES

John Erith

Pictorial photographs can do more than *show* a subject. They can create the illusion of *feeling*. This subject, for instance, could be just so much spinach except for the emotional pleasure aroused by the rendering of the leaves. The sheen creates the "feel" of the cool, silky surfaces.



EBB PATTERN

J. H. Dashwood, ARPS

From the Royal Exhibit of the Pictorial Division

Another cause of failure is the tendency on the part of many workers to regard the negative and positive processes as entirely separate. They are merely different stages in *one* operation. Normally, the aim should be to relate the opacity of the negative to the tones present in the subject in such a way that a similar ratio will be reproduced in the print. Quality will suffer unless treatment is correct at *every* stage.

The difference between *perfect* print quality and less than perfect often is subtle. The photographer, therefore, should act upon the assumption that he has only one grade of printing paper, and aim at producing negatives which will be suited exactly to it. Papers of different contrast grades should be regarded only as stand-bys in case of slight errors of judgment or for occasional use when a particular effect is desired.

There are other contributory causes to shortcomings in pictorial photographs, such as:

Dirty lenses on camera or enlarger. Camera-shake during exposure. Failure to use a lens hood at all times. Prints fogged during enlargement because of un-safe safe-lights or light-leaks from the enlarger. Use of insufficient or exhausted developing solutions. Taking for granted the temperatures of solutions instead of measuring them with a thermometer. Skimping tests in making prints with risk of incorrect exposure. Constantly changing film, paper, and developer without reason other than desire for novelty and experiment.

Workers in the pictorial field often comment that pictures which look well in small size lose in effectiveness

when enlarged, and that other pictures appear better in the larger size than in the smaller. The factor of influence here is viewing distance. A print held in the hand is seen, customarily, at a viewing distance of one to two feet. On the salon wall the viewing distance is six feet, or more. When the print is in the hand the eye can observe every detail and tonal difference. When a print is on the salon wall, minute details are lost and tonal differences tend to merge into one neutral tone.

The experienced worker, understanding this situation, incorporates in his exhibition prints a certain boldness of presentation which gives them the ability to "carry." This is done usually by selecting subject-matter which, under certain lighting conditions, assures definition of the principal masses, and then by arranging the print processing so that the areas of tone will be separated, yet without loss of gradation.

It is desirable for an exhibition print to have certain dramatic qualities so that the eye is attracted at first glance. This attraction is due to boldness of design and to effective arrangement of highlight and shadow areas. However, some pictures which thus attract the eye at a distance will, upon closer examination, occasion some disappointment because of weakness of subject-matter or lack of genuine artistic feeling on the part of the photographer. The more successful prints are not necessarily those which strike the eye, but which, upon closer examination, reward the viewer with such increasing pleasure and appreciation that he is compelled to return and see the pictures again.

What About Salons?

Photographic exhibitions, or salons, widely have been criticised as being uninteresting and out of touch with the present-day outlook. Still, so many prints are submitted for salons that only a small proportion can be hung.

The support of salons by photographers is remarkable, yet does little to prove that the level of artistic achievement is satisfactory. The non-photographer's public does not attend. The enthusiasm of photographers cannot be ascribed to interest and pleasure in handling photographic processes, nor to hope for prestige through successful exhibiting.

The answer is simple, yet seldom perceived because it is so obvious. The determining factor is the pleasure and mental relaxation experienced in looking for pictorial material.

The making of pictures in any medium may be likened to a medal. The face represents the pleasure given to others by works of art. The reverse is the pleasure the artist experiences in creating them. In all but the gold medal of exceptional talent, the image on the reverse may be of the greater value.

Indeed, the chief justification for pictorial photography is to be found in the reverse of the medal. The majority of pictorialists would drop photography like a hot brick if it ceased to give them pleasure to practice it as a hobby. They use the camera because they really enjoy making pictures.

THE 1951 PHOTOGRAPHIC SOCIETY OF AMERICA INTERNATIONAL EXHIBITION

DETROIT, MICHIGAN

OCTOBER 9—NOVEMBER 4

This photograph, used on the cover of the exhibition catalogue and the 1951 PSA sticker, was originated and photographed by Jean Elwell, using the Detroit 250th birthday as the theme for the design. Vintage 1910 runabout (photographed by permission of the Detroit Historical Museum), against a modern skydrop (donated by Copycraft), with three characters—Diane Beckett, John Kalter, Harvey Croze—costumed by Jean, carried out the automotive, historical theme used in the advance advertising for the convention.





CIRCUS PERFORMERS

Wolfgang Lauter

nature division

MONARCH BUTTERFLY
EMERGING FROM CHRYSALIS

Louis Quitt





BITTERSWEET

C. P. Taylor

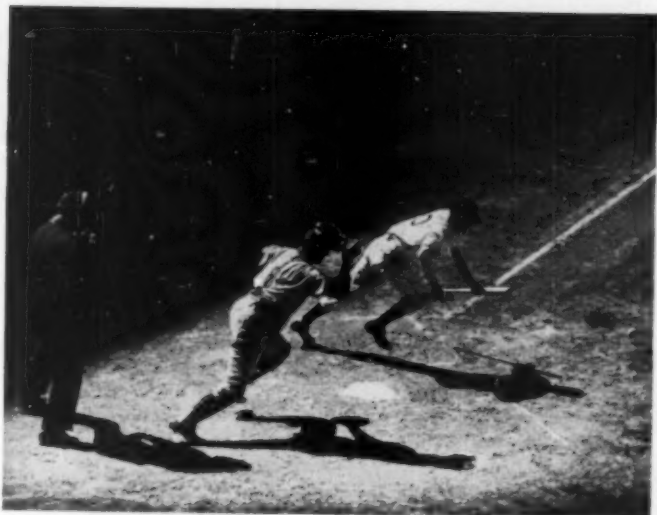
color division

photo-journalism



WHO DONE IT?

Roy A. Bash



THE BUNT

William A. Kuenzel

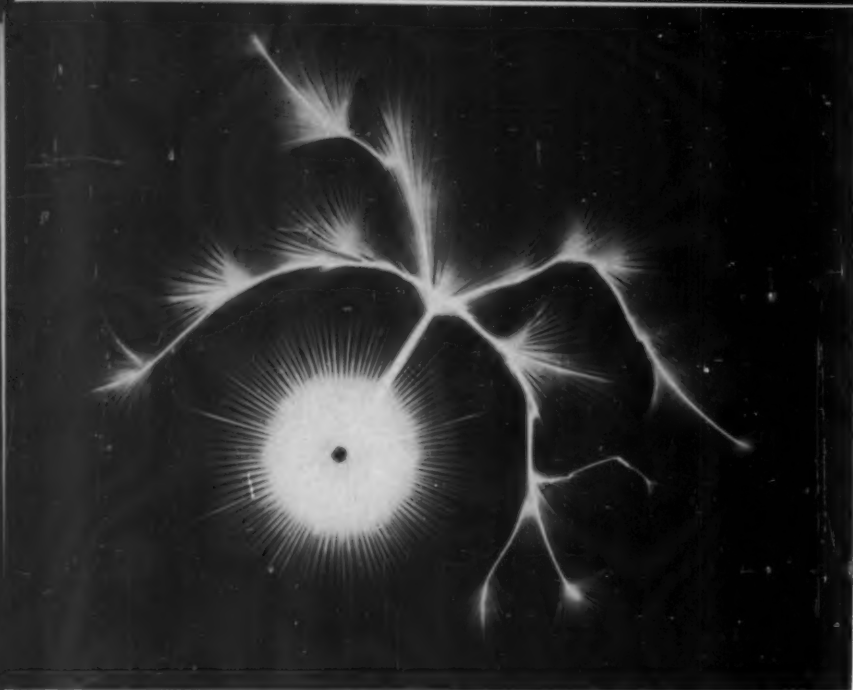
pictorial division



TWO PRINCESS
Francis Wu

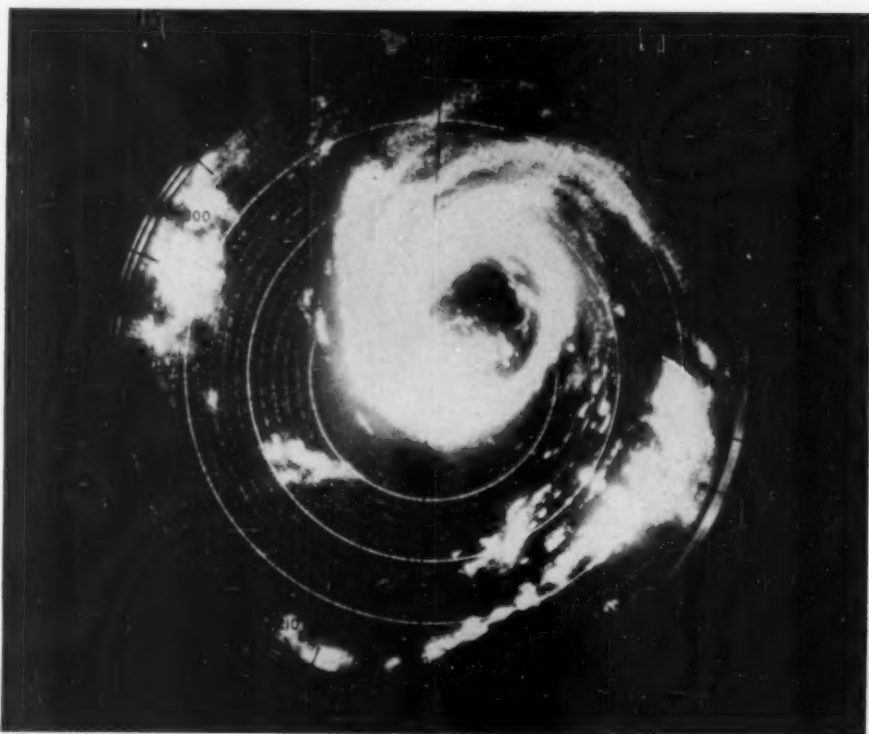


TEAM WORK
Wellington Lee



ELECTRICAL DISCHARGE THROUGH PHOTO EMULSION (NEGATIVE CHARGE) J. M. Kuehne

technical



HURRICANE
AS SEEN
ON NAVY
AIRCRAFT
RADAR
SCOPE.

Official U. S.
Navy
Photograph.



PHOTOGRAPH OF NEW YORK CITY

E. K. Kaprellan



division

HUMAN
EMBRYO OF
43 DAYS DE-
VELOPMENT.

Chester F.
Reather

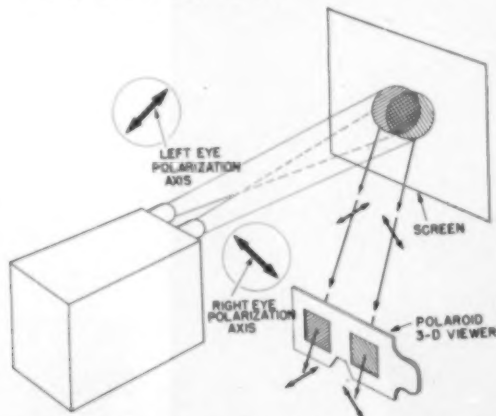
The Stereoscopic Art—Part 2*

J. A. NORLING, APSA

Modern Viewing and Projection

Bringing out a modern camera for three-dimensional use was not enough to stimulate the rebirth of interest in the stereoscopic art. There had to be some device enabling people to see the three-dimensional picture. The manufacturer of the Stereo-Realist appreciated this from the outset, and accordingly brought out an individual viewer. Similar camera-viewer combinations have appeared since the Realist made its debut. But an individual viewing device is hampered by an obvious shortcoming; it limits the pleasure of looking at a three-dimensional picture to one person at a time. This shortcoming does not apply, however, to projected stereo pictures. Shortly after the introduction of camera-viewer combinations, a three-dimensional projector became available and it enables many people at the same time to see and enjoy the same stereo pictures. There are now several stereoscopic slide projectors on the market, all more or less alike.

In addition to the added enjoyment it provides, the projection of stereograms to fill a large screen does one more thing that the individual and personal stereoscope never can accomplish, and that is to create the feeling that the scene is big. While it is perfectly true that the picture on the screen may be of the same angle of view as the same picture mounted in a stereoscope, and that theoretically there should be no physical reason why the scene elements should not appear the same in each, looking through a stereoscope very often gives one the feeling that he is looking at a miniature, and he has that feeling whether or not the scene was photographed normally. Perhaps the fact that the picture is itself small in dimension gives rise to the feeling that the original scene must likewise be small.



Illustrating the principle of Polarized light stereoscopic projection.

Most stereograms made today are in the form of slides which are looked at through a hand-held viewer or seen as projected images. The hand-held, self-illuminated viewer is a familiar device. Some viewers, including the Realist, have provision for a variable lens spacing—a valuable feature that contributes to visual comfort. The Stereo-Realist image is $\frac{3}{8}$ " wide and $\frac{15}{16}$ " high, but there are other mask sizes such as 1" wide by $\frac{7}{8}$ " high, and $1\frac{1}{8}$ " wide by $\frac{15}{16}$ " high. All can be mounted in the standard $1\frac{1}{2}$ " x 4" glass, which will go into the slide carriers of the new stereoscopic projectors. For professional type slides, each member of the stereo pair is made up in standard $3\frac{1}{4}$ " x 4" glass, and put into a holder which accommodates the two members side by side.



Various types of Polaroid 3-D viewers.

Projection of stereo slides requires the use of polarizing filters, one for each lens, an aluminum surfaced screen, and polarizing three-dimensional viewers.

The projection filters are arranged with their polarization axes slanting 45° from the vertical, one slanting to the right, the other to the left. The viewers have polarizing filters which also "slant" in the same manner. Consider the light from the right hand lens, with a polarization axis slanting toward the left. The light reflected from the screen can be seen through only the right-eye polarizing filter, because it too has the same left-hand slant while the left-eye filter has a right-hand slant, 90° from that of its mate. Thus the "right-eye" light is blocked from reaching the left eye, and the "left-eye" light is blocked from reaching the right eye.

The reason for using an aluminum surfaced screen is that this type of surface will not disturb the polarization of the light. A fabric or glass-beaded screen will cause the polarization to disappear, the light to become ordinary light again. The result is that the two images will be seen by both eyes, and will look jumbled like a double exposure.

* Continued from page 708, November 1951 PSA JOURNAL.

Plastic screens are now available for rear projection of polarized light stereograms. Rear projection adds a brilliant quality quite different from the reflection method, although a "hot spot" may be disturbingly apparent unless arrangements are made to keep the spectator's eyes and the projection axis from lining up.

For extremely dramatic stereogram presentations, a picture 18" wide can be thrown by a projector containing two 1200 watt bulbs and a pair of 18" f/3.8 lenses. With a picture this wide, an audience is usually given to "oh-ing" and "ah-ing" with delight and surprise as each successive stereogram appears on the screen.

Hyperstereoscopy

Hyperstereoscopy is the term applied when an interaxial base several times normal is used. It has often been employed in mountain photography and serves admirably to reveal distant details in relief. The base employed is often 100 yards or more. Care must be taken not to include any foreground, otherwise one image will contain elements not present in the other, and it will be impossible properly to fuse the stereogram. Since mountains can usually be depended upon to stand still for a long time, there is time to set up the camera and to transport it from one extreme of the interaxial base to the other. But clouds are not so considerate in "staying put" as mountains, so the exposures should be made on a cloudless day.

Hyperstereograms, properly made, require that certain rules for determining the interaxial be followed. The simplest one is

$$\frac{d \times D}{D - d} \div 50$$

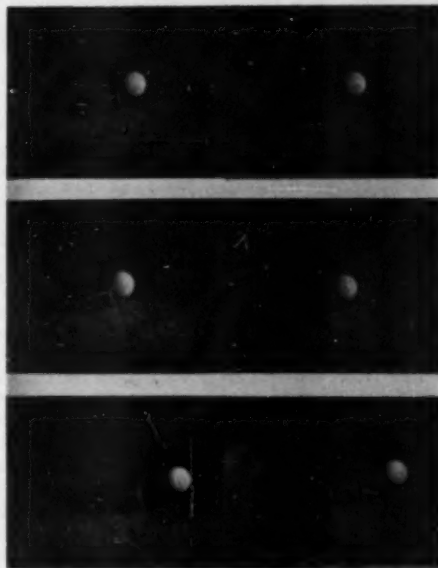
where d is the distance to the nearest object, D the distance to the farthest and 50 the divisor whose use assures success.

Keeping within the limits prescribed will give the stereograms the most vivid relief possible without eyestrain in viewing.

Hyperstereoscopy has been employed to make stereograms of bodies in the solar system, where even the mean diameter of the earth often proves insufficient as an interaxial base. Stereograms of most planets have been made and interesting data has thus been obtained. Included has been the discovery of a planetoid, which was found as the result of this type of stereoscopic survey, and it was appropriately named Stereoscopia in tribute to the method. Stereograms of the moon have been made which reveal intimate details of its craters and seas. Some of the most remarkable have been those of Saturn and its rings, one pair of which required the movement of Earth through space that was the equivalent of an interaxial base of about 1,000,000 miles, which is the distance traversed by our planet in its orbit during a 24 hour period. Other stereograms of this planet made with an even greater base disclosed clearly the separation of its unusual rings one from another and from the planet.

A word of warning concerning hyperstereoscopy: it does not seem to produce satisfactory results for close-up objects, and certainly will not do so if such stereograms are projected. This is so for close objects because the

angle formed between the two lenses at the base and the object is so great that it throws distortion into the images. For instance, photographing a golf ball at a distance of one foot and using a wide interaxial will produce a stereogram which makes the golf ball appear egg shaped, and golf balls having this shape give neither the player nor the viewer any pleasure.

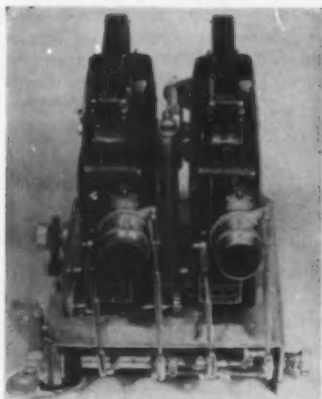


Stereoscopic views made by high-speed flash, 1 micro-second exposure at $f/9$ in Ektachrome.

High speed stereoscopic photography is often employed for special purposes. Such stereograms often reveal things not readily apparent in a flat picture. They are particularly useful in the study of machine elements in motion and for other kinds of research. A series of three high-speed "strobe" shots were made for United States Rubber Company to prove the behavior of a golf ball. The illustrations show the impact of the club head, the "flattening-out" of the ball before leaving the tee, and the ball in its flight a few inches ahead of the club. These shots were made on Ektachrome film at a speed of one-millionth of a second, using one of Professor Harold E. Edgerton's newer flash units. Professor Edgerton and Henry Lester worked together in obtaining these shots. The projected pictures showed no "egg-shape" distortion which would have resulted if an interaxial larger than called for by the object distance had been employed.

No graphic means, besides the stereogram, can substitute for the re-creation of the "real" in a still-life, and in stereo movies realism reaches the ultimate, for they can include movement, color, and action as well as depth.

The principles employed in photographing and projecting stereoscopic slides also apply to stereoscopic motion pictures. The same fundamental requirement that each eye sees only the picture intended for it also applies to the moving stereogram.



Interlocked 16mm cameras for stereoscopic photography. Courtesy Carl Breer.

Stereoscopic Motion Pictures for the Amateur

The experimentally inclined camera enthusiast will get a lot of thrills in making and projecting stereoscopic movies. Some have done it, others are planning to enter this new field. To encourage those who are thinking about it, I shall cite the experiences of one avid fan, Mr. Carl Breer, Vice President and Director of Research of Chrysler Corporation. He has kindly provided the accompanying photographs illustrating his camera and projector arrangements.

His first camera hook-up consisted of two 16mm Magazine Cine-Kodaks, mounted so their lens axes could converge on any desired plane. He selected Magazine Cine-Kodaks because they were the most adaptable at that time (1940) for mounting at the normal $2\frac{1}{4}$ " interaxial. Since this camera arrangement requires two strips of film, he found it necessary to rig up interlocked projectors to show his pictures. Accordingly, he selected two Bell and Howell 16mm projectors and interlocked them mechanically.

Carl Breer has had a lot of fun with his stereoscopic motion pictures, not only in taking pictures and exhibiting them to his family and friends, but also in devising the ways and means.

35mm Stereoscopic Motion Pictures

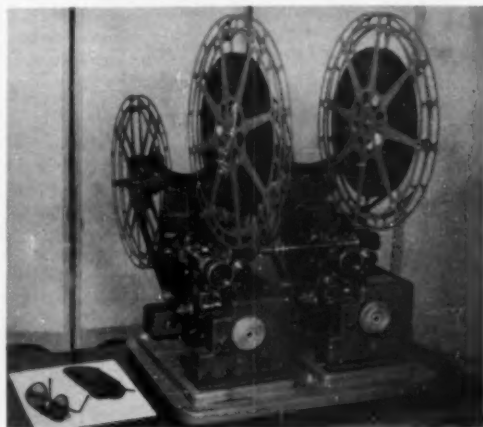
It seems incredible to many of us who have worked with three-dimensional pictures that the vast motion picture industry does not have an extensive stereoscopic research, engineering and development program. Occasionally, at the meetings of the Society of Motion Picture and Television Engineers, the subject of three-dimensional motion pictures is introduced. There is usually a remarkable response from the members present, and also from the press.

The art of stereoscopy has "sex appeal" but it seems to have escaped the concentrated attention of most of the people in the Hollywood area. The men in the drivers' seats of the movie industry have, for the most part, failed to have a vital personal interest in and understanding of three-dimensional movies. That the industry could use something to combat television's capture of more and

more of the theatre audience is undeniable. Stereo movies might well induce people to return to their former favorite amusement. But the return is likely to come about in the mass only if the film theatre gives them something they can't get on a 17" TV tube, namely the ultimate in photographic realism, the stereoscopic movie in full color, with all the dramatic possibilities that are only waiting to be appreciated. The enthusiastic public reception given some earlier stereo movies, and the dollar profits from these movies are a matter of record. Newer, better stereo techniques are now available, and the reason for introducing them was never more pressing.

The Anaglyph

One of the early and noteworthy theatrical exhibitions of stereoscopic motion pictures occurred in 1924, when J. F. Leventhal produced a few "shorts" utilizing the anaglyph process. There followed an eleven-year lull in the use of stereoscopic films. Then, in 1935, Loucks & Norling Studios and Mr. Leventhal jointly produced a series of short films again employing the anaglyph prin-



Two 16mm projectors interlocked for stereoscopic projection.

ciple, this time in talking picture form. These films, which were called "AUDIOSCOPIKS," were released by Loews, Inc. and proved to be some of the most successful short subjects ever issued, winning not only domestic acceptance, but an unprecedented play in the foreign field, notably in France, Spain and Great Britain. That their success should have indicated further pursuit of the anaglyph process seems logical. But the producers had, from the beginning, realized the inherent limitations of the anaglyph process and concluded that films exhibited by that process would only be adequate as novelties and would never be tolerated for full-length feature releases. This conclusion was arrived at by a recognition of the visual "insult" resulting from the projection of one color to one eye and its complementary to the other. This sort of delivery of images, one color to one eye, another to its mate, produces "retinal rivalry" and brings on physiological disturbances that may induce nausea in some

observers if they look at the anaglyph movie longer than a few minutes.

Since this process—the anaglyph—has played an important role in the advance of the stereoscopic art, it would be well to describe it here briefly. Its invention is credited to Ducos du Hauron, who applied it in 1895, although there is some evidence that its possibilities had been explored many years before that.

In one form, the anaglyph images are on two separate films. One member of the stereoscopic pair is projected through a filter of one color, the other through a filter having a color complementary to that of the first. In another form, the one that was used for "AUDIO-SCOPIKS," the anaglyph images are printed in complementary colors directly on film and projected in a standard projector without filters.

The projected images are viewed with spectacles having windows of the same colors as the colors on the screen. Red-orange for the right eye filter and blue-green for the left are often used. The right-eye red-orange filter in the viewing spectacle renders the blue-green right-eye image in monochrome and the left-eye blue-green filter renders the red-orange left-eye image also in monochrome. Since dyes and pigments hardly ever are capable of transmitting only the color they are supposed to transmit, there is rarely a complete "cutting" of one color; some of it always comes through so that part of the blue-green image which is supposed to be blocked by the blue-green spectacle filter leaks through, producing a "ghost" image. So, in reality, one eye sees a part of the image intended for the other; the "part," of course, being defined as a very dim, but still discernible remnant of the whole "other-eye" image.

Good picture quality has never characterized the anaglyph. This and other shortcomings make it eligible for discard as a practical system for motion picture features.

Since the introduction of Polaroid light-polarizing filters, it is possible and practical to substitute these for

the red and green filters of the original anaglyph process. Strictly speaking, the polarized light method may be defined as another form of the anaglyph. Actually, Polaroid Stereoscropy would be a good name for it, since Dr. Edwin H. Land, head of Polaroid Corporation, invented the first practical and efficient synthetic polarizer which hastened the increasingly widespread use of the present satisfactory methods of stereoscopic projection.

Stereoscopic Motion Pictures at the New York World's Fair

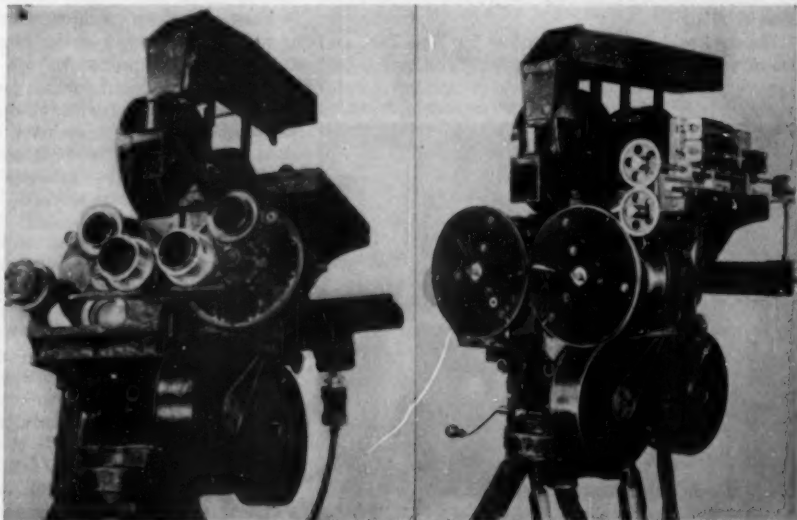
The first large-scale public exhibition of a 35mm stereoscopic motion picture with excellent picture quality took place in 1939 at the New York World's Fair. That year a black-and-white film was shown. The following year a similar subject was exhibited in Technicolor. More than five million people saw these films,* and they're still talking about them. Some of the production and exhibition problems posed by these pictures are interesting to consider.

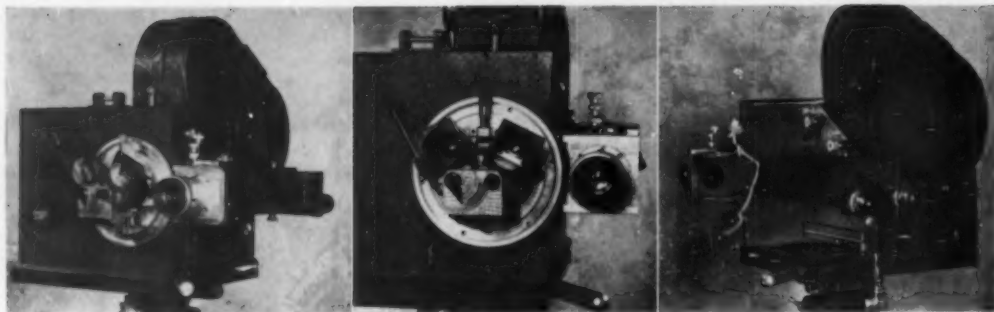
The camera assembly for the black-and-white picture consisted of two Bell and Howell professional 35mm cameras mounted so that one was "upside down" in relation to the other. This was done so that the lenses could be brought close together. Even with this arrangement, the interaxial was not ideal. It was fixed at $3\frac{1}{4}$ " although calculations showed that some scenes actually required as close as $1\frac{1}{2}$ " interaxials. But no such camera was available then, nor was there time to have one built. However, a complete set of matched lenses of different focal lengths effected a quite satisfactory compromise with the ideal.

The greater part of the picture was a sort of fantasy, showing the parts comprising a Plymouth car dancing around and assembling themselves. Their movements were in synchronism with music and required the use of

* Produced by the author.

Left—Bell & Howell 35mm camera interlocked for stereoscopic photography. Simultaneous focussing of the lenses is effected by rack and gears. Right—Bell & Howell 35mm interlocked cameras provided with three-color filter wheels for making stereoscopic color-separation negatives by the successive-exposure method. Used only for "stop-motion" work.





Left—The Loucks and Norling Studios' 35mm stereoscopic motion picture camera. Camera is in shooting position. Center—Front of the 35mm stereoscopic camera showing the variable interaxial system which has a range from $1\frac{1}{2}$ " to 4". Right—The 35mm stereoscopic camera racked over for lining up the scene and focusing. The binocular view-finder has interocular adjustment.

"stop motion" photography; that is, "one frame-at-a-time" shooting. But a substantial part of the film contained "live action" shots taken in the foundry and shops and along the assembly line. The narrator for the film was Major Bowes of Amateur Hour fame. He appeared in "live action" in one sequence in which he spoke. This was the first "live action-live dialogue" shot ever made in a stereoscopic presentation. It created some difficult problems since the cameras would not fit into any available studio "blimps." However, the sequence was shot without any parasite camera noises being recorded, thanks to the intelligent help rendered by Mr. Walter Hicks, then of the New York Fox-Movietone Studios.

Since the Chrysler film was shot in a two-camera setup, and no special photographic and projection facilities for single-film handling was available, it was necessary to project with two projectors. A rather complex Selsyn motor drive was used for interlock, although a much simpler synchronization could have been attained by a straightforward mechanical linkage, such as was used for the Pennsylvania Railroad stereoscopic movie display at the Golden Gate International Exposition in San Francisco in 1940.

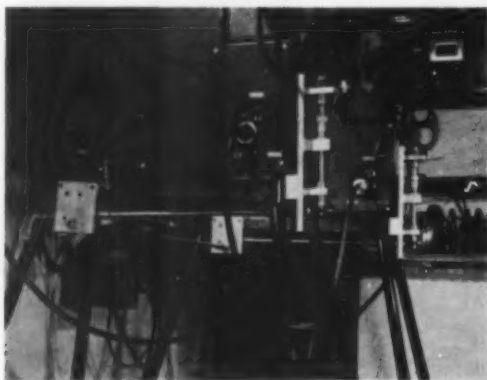
The dual projector system used at the New York and San Francisco Fairs is substantially the same as that recently on exhibition at the Festival of Britain. Accord-

ing to press reports, it is also the same system which has recently been demonstrated by the Natural Vision Corporation of Hollywood.

A Technicolor film, using the stop-motion technique as well as live action shots on monopack was our next stereo production. For the stop-motion sequences, a unique filter attachment was arranged in front of the camera lenses. The filters were mounted on wheels which rotated together. Color balance was attained by making sectors having angular dimensions calculated to pass the quantity of light required for each color and as demanded by the sensitivity of the film. The "A" (red) filter passed light to which the film was more sensitive than that passed by the "B" (green) and "C5" (blue) filters. Consequently, the red filter had the narrowest opening of all and the "C5", to whose transmission the film was least sensitive, had the widest opening. The exposures were made by the alternate frame method of color separation. Three frames, one the red record, one the green, and one the blue, were made instead of one frame as in ordinary photography. This procedure is followed in the photography of animated cartoons.

These separation negatives were used by Technicolor to make the printing matrices from which the dye imbibition prints were produced.

It has always been the author's opinion that the stereoscopic camera for professional use should be built to take the images on two separate films. This is to afford the greatest flexibility in the studio and to permit the use of short focus lenses and to facilitate the making of optical effects in the duplicating processes. One such camera was built. It contains the features deemed essential to a versatile camera. The most important are a variable interaxial and a convergence control, but important too is a binocular finder showing in miniature a three-dimensional view of the scene to be photographed. Visual inspection during focusing seems superior for stereoscopic work and focusing is easier when the view is seen in three dimensions. The binocular view finder has an additional advantage: it enables the cameraman to compose the scene stereoscopically using the interaxial and convergence controls, manipulating them until he gets the best possible arrangement. He can increase the interaxial if he wants to increase the apparent depth of the scene. He can reduce it if nearby objects demand it. (To be continued)



Mechanical interlock of two 35mm projectors.

"How To"

No. 21—ATTRACT AND PHOTOGRAPH WINTER BIRDS

JOHNNY APPLESEED, APSA

THIS COLUMN has had as its major, general objective to help you enjoy your photographic hobby, and the job has been approached in several ways: you've been instructed in techniques, your questions have been answered, you've been shown where to go to get pictures.

This month the program is carried right into your own backyard for one of the most thrilling and rewarding photographic activities you can imagine and one which should interest the Mrs. and the kiddies, too. Not only can it yield wonderful pictures, but you'll get a real education as well as cheery songs on snowy days. What more could you ask for a small expense and a little time? I recommend highly that you try to attract winter birds if your surroundings lend themselves to the project, even if you don't make pictures at first.

There are many little tricks to this business, some of which I don't know and some that space limitations won't allow printing. If, after reading this, you have worthwhile tips to pass along, by all means drop me a line. As usual, best comments will be printed.

Attracting the Birds

Birds can be attracted by means of an artificial food supply, provided by you in feeding stations. When the birds are visiting the station regularly, you remove or cover all food except that in one small spot. Focus your camera on this spot and you're in business.

A feeding station may attract more birds than can normally be supported naturally by your locality through the winter, and if the extra food which you supply were to stop even for a short period, existence for them would become difficult. *Once started, food must be replenished daily until the end of winter.* You owe it to your little friends to stick by them.

The standby foods are suet and sunflower seeds, together with smaller seeds. Table I shows the varieties of foods relished by the various birds worth attracting. The small seeds mentioned there are any of several available from pet stores: wild bird mix, hemp, millet, canary seed, chick feed, cracked corn, wheat. Ripe corn on the cob can be hung from the bird feed. Grit is essential for bird digestion so you should supply fine gravel or sand.

If you wish to start modestly, tie a piece of suet to each of several tree limbs and fix up a feeding station in which you can keep a supply of sunflower and small seeds. Start before the snow flies, so the birds will stay in your locality once they've located your table. In this way, I had regular visits my first winter from chickadees (my favorites), cardinals, juncos (also known as snow birds), song sparrows, fox sparrows, hairy woodpeckers, blue jays, pheasants, and many less desirables. My winter thoughtfulness was repaid many times over with cheery songs such as I was accustomed to have only in the summer. The cardinals, song sparrows, and chickadees spent most of the summer with us, too. With a little luck, you can



This photograph of a black-capped chickadee was made at the camera setup illustrated. The evergreen branch was clamped to a support standing on the tray and unwanted twigs and cones removed. After the birds had learned to expect to find tid-bits on the branch, the camera was set up and exposures made on fast pan film at 1/100 second and f/22 with a Press 40 bulb 4 feet to the right at about 20° angle and with a No. 5 bulb for fill-in at the camera.

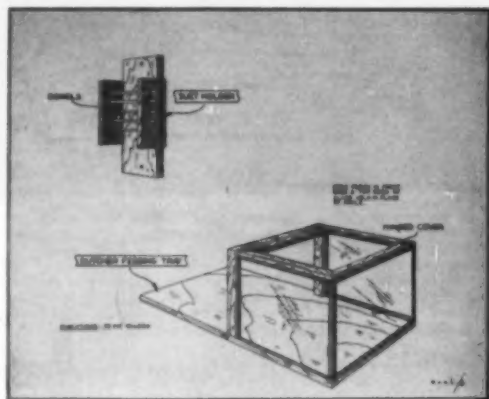
do as well unless you live where trees and bushes are scarce.

Suet will stand exposure for many winter months before becoming inedible. You can handle it in various ways: merely tie it to a tree; a wire soap dish tacked to an upright board works well, as does a similar device made from wooden dowels (see drawing); you can stuff it into crannies in trees and stumps or in a small log in which you've drilled large shallow holes. The kiddies will enjoy helping prepare chickadee diners. You can make these by drilling holes about 1 inch deep and 1 inch in diameter in scraps of 2 x 4 or in logs up to 2 feet long. Let the children melt the suet and pour it mixed with seeds into the holes. You can hang these devices from limbs. If you want to be more fancy, pour the melted mixture into small paper nut cups and insert them into holes of proper size, replenishing as the old ones become empty. You can also hang a piece of suet in an open mesh bag, such as an old dish cloth.

Winter feeding of birds offers many opportunities for a family project. As mentioned, the children can help

with preparation of suet. They can place the food in the feeders as necessary; and if your success warrants, they can continue the project into the summer by planting and raising sunflowers and other seed bearing plants.

The feeding station can be a simple, open tray as shown in the illustration, or a roofed tray with open sides. A cover is helpful in protecting the food from rain and snow, thus making food always available and protecting it from souring, but birds are more timid about entering covered stations, even when the sides are of glass. With an open tray, snow should be removed after each snowfall. To start, you might try something simple, as I did: a wooden tray about $1\frac{1}{2}$ x 3 feet and 1 inch deep, nailed to a 2 x 4 dug into the ground, and covered with a curved section of smoke pipe running in the long dimension. A few small holes in the bottom helped drainage. This device, placed just outside our kitchen window and stocked with small seeds and sunflower seeds drew birds which so enraptured Mrs. Appleseed that she suddenly liked to wash dishes. The one-inch side boards will prevent seeds being blown off easily, but if you're going to make pictures of birds on the feeder floor, leave the side board off on the camera side so the birds are not hidden from view. If you prefer a covered tray, try putting some perches near the entrance; the birds will alight on them before going to the tray and you can "shoot" them there.



A SIMPLE FEEDING STATION.

If it is not convenient for you to replenish the open tray frequently, you can build a hopper on one end. This is merely a narrow, tall box with a slit or hole at the lower edge of one side, through which fresh seeds flow as the exposed ones are consumed.

By laying in a good supply of small stumps, sticks, evergreen branches, and clods of grass and using these in the feeder you can vary your picture stage. If you're willing to forego aesthetic considerations a simple board is effective; it should be cut so that its width corresponds roughly with your camera field.

Try to place your feeder where it can be watched easily from a window, even if you don't plan pictures. Consider also the type of lighting available and the background. Pictures should be against a simple background such as the open sky; lawn is acceptable and so are ever-

green branches, but try to avoid deciduous shrubbery after leaves have fallen. You may wish to install an artificial background of about 4 x 5 feet of wallboard, painting it a neutral color for black and white or sky blue if to be used for color. A spare background will help by not disturbing the birds when a board is removed for cleaning.

The Surroundings

Surroundings are important. Concealment from view is safety instinct No. 1 with birds. Most birds like a protective hedge or large trees near the food, with low bushes between the hedge and the station. Such an arrangement permits them to approach the feeder cautiously and to fly into the cover at any sign of danger. The nearest shrub should be no closer than about 10 feet to make their minds at ease as far as lurking enemies are concerned. If these bushes, the hedge, or nearby plants have edible berries, the chances are good that you'll have birds. As many as 93 bird species are known to feed on the fruit of various Dogwoods, for example, and 118 are recorded as liking the common Elderberry. The Viburnums are also popular. Table II shows a few trees that birds like in summer and winter. The food-producing plants probably have more bird appeal than those which afford merely shelter and refuge.

Don't be discouraged if you haven't bushes with edible berries; you can attract birds anyway by placing seeds and suet in advantageous places. In fact, if you observe birds in some part of your garden, you can lead them to your feeder by putting up a series of food samples between the hangout and your feeder. These subsidiary feeders should be taken down when the birds have learned to come to the main feeder. If the birds come to the garden but are slow finding the main feeder, a trolley feeder might be tried. This is a roofed tray with open sides suspended from a clothesline stretched between two pulleys. After the birds find the tray, you can move it forward a few feet each day until it is over the main feeder.

Some birds, among them juncos and cardinals, like to eat on the ground. If you have the opportunity and if you need to coax birds to your feeder, try putting a few seeds under some nearby dense trees, where little snow falls.

Running water is a big attraction. A hose may be fixed up near the feeder, so that water will drip from a fair height into a shallow pan, or a bucket allowed to drip from it into the pan. It may not be possible to provide running water during the winter, but if the birds have been lured to the feeder before frost arrives, they will probably stay.

Identification of Guests

While there are many helpful books and manuals for bird identification, I have found Roger Tory Peterson's "A Field Guide to the Birds" the most useful. This book, which is sponsored by the National Audubon Society, has 1000 illustrations, of which 500 are in full, accurate color. Its price is reasonable, too.

The greatest pest around a feeding station is the English sparrow. Sparrows are nervous birds; when not frighten-

ing other birds by their own jittery actions, they will eat the seeds (particularly the small ones) intended for other birds. Sometimes, though, their enthusiastic chatter seems helpful in attracting the attentions of other birds which come eventually out of curiosity to see what has caused all the noise. There is no sure way to deter them, but some tricks may keep them away temporarily, if you wish. They seem to prefer cultivated grain, like wheat and oats, to wild seeds and it is worth trying a separate feed of chick feed for their benefit. A tilting food shelf may keep them off until they learn to balance safely on it. This is made by hinging one side of the tray, while the other is suspended by wires attached to light springs, so that when a bird alights on it, its weight causes the tray to sag.

Because of his wariness, the English sparrow is not easy to trap, but it can be done. When trapped, their tails can be clipped, after which they'll confine their business to your neighbor's property. If you use a pull-string trap, there will be no danger of trapping desirable birds. This is a cage of chicken wire with the door hinged at the top and held open by a stick; a string attached to the stick can be pulled when the birds enter the trap. One caution: when clipping tails, be sure it is English sparrows you're dealing with and not song sparrows, fox sparrows, tree sparrows, chipping sparrows or any of the other true, desirable sparrows. (English sparrows really aren't sparrows.)

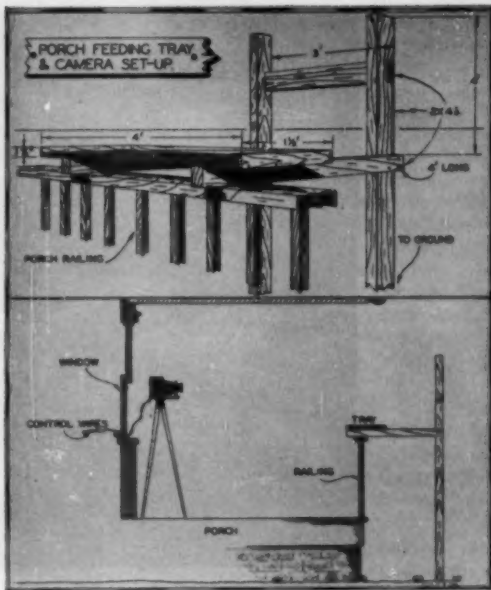
Squirrels can make fast work of a food supply. They're persistent rascals, too. They are easily trapped (see comment on page 647 of the October JOURNAL) and can be deported far from your premises.

Cats and birds don't mix. Birds won't come where cats are found. The tray should be sufficiently high and far enough from other objects to prevent cats from jumping onto the feeder and supporting posts should have guards in the form of large inverted metal funnels. Cats can be trapped, using fish heads as bait.

Camera and Lens Requirements

While some cameras definitely have advantages over others, there is no reason why acceptable pictures cannot be made with whatever camera you have available. For best quality in the print, try for as large an image size as possible. Of course, in doing this you'll be up against the perennial problem of getting adequate depth of field and shutter speed. A good compromise is a lens of about 6 inches' focal length, used at 3 feet for small birds and at 4 feet for Robin-sized birds. Longer focal length lenses will have too little field depth, while those of shorter focal length will have to be moved up closer and will tax the confidence of some of the more timid birds and result in long waits for pictures. Allow enough field coverage to catch the bird near the bait, without the danger of cropping off his tail.

Fixed focus cameras and most folding types require supplementary lenses to permit close-up work. When using such equipment, measure all distances with great accuracy and make allowances for parallax. Twin lens reflex cameras require similar parallax adjustment. Single lens reflex cameras have many advantages but these may be outweighed by focal plane shutters, which are noisy



PORCH FEEDING TRAY AND CAMERA SET-UP.

and difficult to operate by remote control. View and press cameras have advantages of accuracy of ground glass focusing and most have interchangeable lenses and so permit choice of focal length.

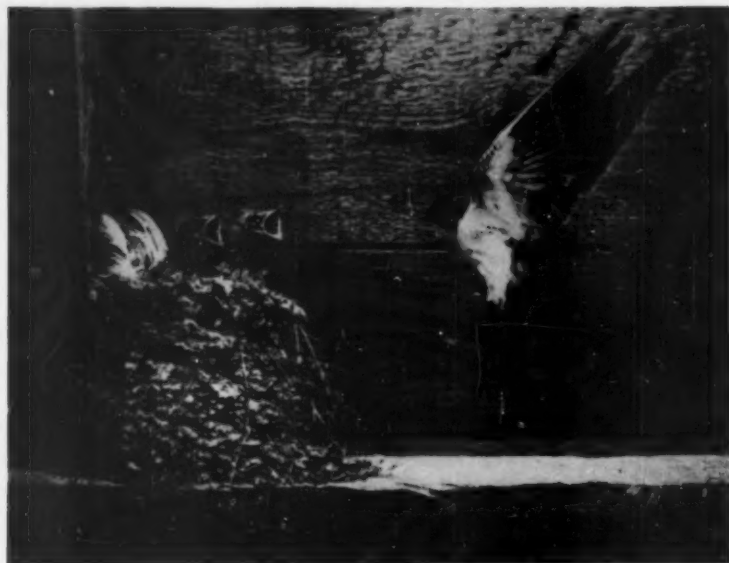
Between-the-lens shutters are preferable because they are quiet, are easy to handle by remote control, and because they are easily synchronized with flash. Noise disturbs birds more than flash.

When you find it necessary to place your camera closer than three or four feet from the tray, you'll find it desirable to use a bird blind or a dummy camera.

Blind

This is a structure made to conceal the camera or the photographer, or both. Be sure to make the blind large enough to be comfortable and not cramped. A packing case will usually do the job. For something more portable, use an old beach umbrella to which burlap can be attached to form walls; or drive four- to six-foot poles into the ground to form a square of three to four feet, connect the tops with wire and cover the whole with burlap. Start with the blind a little distance from the feeding tray and move it in a foot or two each day until you have reached the desired position. When close enough, anchor it securely so it won't be blown over. Tie down all loose ends firmly. Cut a slit in the burlap at the camera position. If this slit is vertical and not too long, it will hug the lens hood and not tend to slip in front of the lens and obstruct its view. Cut a second slit to correspond as nearly as possible with the line of camera view and use this for observation. Prop it open with a small stick.

If the birds are watching warily as you enter the blind



BARN SWALLOW

Eliot Porter

From 6th Chicago International Exhibition of Nature Photography.

and if they seem to be frightened away from it, try taking a companion with you to the blind and while they're still watching, have him leave. Usually, the birds will be tricked into believing the blind is empty.

Tripod manipulation is a problem since the front leg will have to be almost vertical. Hand-held exposures aren't usually successful because fast action is often re-

quired. It is much more successful to focus on one small area and wait for the birds to come there.

Some photographers prefer to set up a camera outside the blind and use the blind merely to screen their own movements, releasing the shutter by remote control. With such a system, the house itself is an excellent blind. The advantage in sitting by the window in warmth and comfort easily outweighs the disadvantages of having to go out to reset the shutter and change film. For this method, the tray should be near enough to a window to give a really close-up view of the birds and to permit you to choose the best shots. An arrangement on a veranda, such as shown in the diagram, is an ideal setup.

The Dummy Camera

Sometimes, it will be necessary for the birds to become accustomed to the presence of a camera and tripod. To avoid damage to apparatus from outdoor exposure, you can make a camera dummy from a box of similar size and shape, attaching it to three sticks in the form of a tripod. Size of box and length of legs should correspond fairly closely to the outfit to be used finally. Set up the dummy about six feet from the tray and move it forward about a foot each day until it reaches your chosen position, where you can replace it with your camera. It is wise to put the dummy back again after you finish making pictures, so the birds will remain accustomed to it.

If the birds notice the difference between the dummy and the camera and act shy when the latter is set up, you may have to use a blind or you may be able to fool them by covering the camera and the dummy with burlap. You can go one step farther by pinning evergreen twigs to the burlap. Avoid loose ends that could flap in the wind.

TABLE I

Bird	Feed
Chicadee	Suet, sunflower seeds, stale doughnuts hung from string, chopped nuts, peanut butter
Titmouse	Suet, chopped nuts, peanut butter
Nuthatches (White-breasted and Red-breasted)	Suet, sunflower seeds, chopped nuts, peanut butter
Downy Woodpecker	Suet, peanut butter
Hairy Woodpecker	Suet, peanut butter
Brown Creeper	Suet, peanut butter
Blue Jay	Suet, peanut butter, sunflower seeds, corn on cob
Flicker	Suet, peanut butter
Red Bellied Woodpecker	Suet, peanut butter
Red Headed Woodpecker	Suet, peanut butter
Cardinal	Sunflower seeds, corn on cob
Pine Grosbeak	Sunflower seeds
Evening Grosbeak	Sunflower seeds
Purple Finch	Sunflower seeds, small seeds
Gold Finch	Sunflower seeds, small seeds
Crossbill	Sunflower seeds
White Throated Sparrow	Small seeds, crumbs
Song Sparrow	Small seeds, crumbs
Fox Sparrow	Small seeds, crumbs
Tree Sparrow	Small seeds, crumbs
Junco	Small seeds, crumbs
Pine Siskin	Small seeds, crumbs
Robin	Raisins and other dried fruits
Thrush	Raisins and other dried fruits

Remote Control

When your camera is out of reach, you'll need to rig up a device for tripping the shutter from a distance. It is possible to buy cable releases up to 20 feet in length but they are generally not satisfactory due to the great time lag between pressing the release and shutter opening. For short distances, a length of fish line or other strong string tied to the shutter release will serve effectively; however, with increasing lengths of string the time lag problem becomes increasingly greater. Flash units which operate with a solenoid release make the best remote control units. With them, it is relatively easy to make a solenoid release from a door bell magnet of the buzzer type. You'll find there are two wires attached to the armature, one on each side. Disconnect one wire and reconnect it with the other; that is, put both wires on the same side. Then mount the magnets and armature below the camera and connect the armature to the shutter release as the shutter tripping mechanism. Adjust the armature and string length to allow sufficient pull to trip the shutter.

Remember that electrical resistance increases with wire length and it may be necessary to increase the number of batteries to get consistent results, especially if you use flash too. A "hot shot" battery connected to the solenoid through a switch is good insurance against failures due to weak current, and it will last many months. The time-lag problem, although greatly lessened by electrical devices, is not entirely eliminated. Learn to anticipate which good poses birds hold for a second or two and aim to press the switch just before the pose is actually assumed.

Time spent studying bird habits and movements will pay dividends in picture quality.

Lighting

Shutter speed is an important item in bird pictures. The kind of lighting you use will have to be sufficient to provide proper exposure and to stop action. In some respects the shutter speed will reflect your ability to anticipate bird movements. Since, as in action of other kinds, there is a short period at the peak of any movement when the bird is relatively still, pictures can be made as slow as 1/10 second, but until you know bird movements 1/100 second is the place to start. If you find this inadequate to stop motion, go to 1/200 second or faster. At these faster shutter speeds, and if the diaphragm is to be stopped down to get necessary field depth, brilliant illumination is a must.

In bright sunshine, unless you succeed in reflecting light into the shadows without upsetting the birds, you'll be plagued by high lighting contrast. Back lighting is best under such conditions. Sunshine diffused through clouds is probably the best form of daylight illumination, even though it means some loss of field depth.

Times when daylight is ideal are very limited and so flash is a natural recourse. It has the disadvantage of lack of desirable background lighting intensity but has the advantage of uniform negative to negative densities. Regular three-quarter portrait lighting with two bulbs is the best for a start. Use of one light will probably give unpleasant shadows and high contrast, just as with strong

TABLE II
PLANTS THAT LOOK WELL AND THAT BIRDS LIKE

Tree	Chief Value	Birds Especially Attracted *
Gray Birch	Food-winter seeds, aphids in summer	Goldfinch, siskin, titmouse, warblers, vireos
Red Cedar	Berries, shelter, some nesting	Bluebird, cardinal, cedar waxwing, chipping sparrow, mockingbird, robin
Flowering Dogwood	Berries, some nesting	Brown thrasher, purple finch, robin, towhee, vireos, etc.
American Elm	Nesting, insect food	Baltimore oriole, purple finch, warblers, woodpeckers
Hathorn	Berries, some nesting	Thrush, purple finch, others
American Holly	Berries, protection, nesting	Cedar waxwing, flicker, thrush, robin
Pepperidge	Berries, some nesting	Catbird, cedar waxwing, flicker, mockingbird, robin, thrushes
Australian and White Pines	Shelter, nesting	Blue jay, finches, thrush, mourning dove
Sassafras	Berries	Catbird, towhee, flicker, robin, vireos
Shadbush	Berries	Blue jay, cardinal, catbird, flicker, thrush
Barberry	Protection, nesting, berries	Catbird, chipping sparrow, thrush, junco, song sparrow, tree sparrow
Bayberry	Berries	Bluebird, catbird, flicker, thrush, warblers, tree swallow, many more
Blueberry	Berries	Bluebird, thrasher, catbird, thrushes, towhee
Elderberry	Berries	Bluebird, thrasher, catbird, thrushes, towhee
Winged Enonymous	Berries, protection, nesting	Catbird, thrasher, cardinal, finch, towhee
Honeysuckle	Berries, nesting	Catbird, thrasher, robin, towhee, others
Sumac	Berries	Bluebird, finch, robin
Viburnum	Berries, nesting	Bluebird, finch, robin, cedar waxwing, flicker, thrush
Winterberry	Berries	Bluebird, thrasher, catbird, cedar waxwing, thrush, finch
Virginia Creeper	Berries, shelter	Flicker, mockingbird, finch, robin

* This list is expanded to include summer inhabitants

sunlight. If you're forced to use a single light, place it near the camera.

Use of flash as daylight "fill-in" is an excellent technique. For more particulars, see the September and October 1950 columns on pages 468 and 539.

Photographing birds is really a most fascinating hobby—much more exciting than sticking solely to exhibition photography—and it is rewarding, too. Furthermore, it offers a wonderful means for interesting and educating the whole family. That's what makes photography the great hobby it is: you can never fully master it in all its variations. This field can easily keep you involved for years. When you think you're pretty good at stills, try doing the same things in movies.

Here's wishing you happy shooting and a wonderful crop of winter birds.

Do you have a photographic problem? Drop me a line at PSA Headquarters, 2005 Walnut Street, Philadelphia 3, Pennsylvania, and I'll do my best to help you.

Next Month: How To Get The Most Speed Out of Films.

Oshawa, Ont., Canada

DEAR JOHNNY APPLESEED:

We're just completing the glorious 10-day trip which you wrote about in the June 1950 JOURNAL. We followed it as closely as possible the way you laid it out and with you to guide us, have certainly seen some wonderful picture material. We hope we got it on film!

Let's have a layout for a trip to Nova Scotia for next year, please.

E. G. TOER

DEAR JOHNNY:

I have been using the divided developer since reading about it in the September JOURNAL. For 4x5 portrait negatives I cut the first solution by 50% water to give me a soft negative. For 120 roll film I use the borax activator.

Results have been quite satisfactory, but in my hands the fine grain (borax) version produces only a medium-fine grain. Do you know an activator that produces a finer grain structure?

For me the Shipman Divided Developer was the big discovery of 1950. Do you know what experience others are having with it?

JOSEPH A. RUSSO

DEAR MR. RUSSO:

Although I'm not experienced in the use of two bath developers, I'm sure some members use them successfully. Some who do may wish to write to you or to me, telling what formulas seem best and what kind of results are to be expected.

To the best of my knowledge, the following two-bath DK-20 is workable and may give you the fine-grain negatives you want.

Solution A

Water	15.00 ounces
Metol	14.00 grains
Sodium Sulfite (anhydrous)	2.00 ounces
Potassium Thiocyanate (or sodium salt)	8.75 grains
Potassium Bromide	2.50 grains
Water to Make	20.00 ounces

Solution B

Kodalk	135.00 grains
Water	15.00 ounces

Dilute 1 part of Solution B in 15 parts of water in use. Use once, then discard.

For roll films, such as Verichrome, start out with about 6½ minutes in A and 3½ minutes in B, adjusting times to suit your desires for contrast.

JOHNNY APPLESEED, APSA

Camera Club Manual

H. J. JOHNSON, FPSA

IN THE following section, we continue publication of the revised Camera Club Manual, Chapter 1, "Camera Club Organization," and deal with some of the problems which may be anticipated by newly organized clubs.

What to Avoid

Out of the sad experiences of some camera clubs have been gleaned lessons of what to avoid in order to make camera club management successful. Since these misfortunes are the general result of natural errors, they are presented at this time so that newly organized clubs may benefit from them:

1. *Repeated reading, discussion, or amending of Constitution and By-Laws.* These documents are basic regulations of the club, to be followed in spirit rather than to the letter, and to be used chiefly for reference purpose. Repeated reading of or action upon these documents, however necessary, tends to become dull and boring to the members, who are more interested in photographic experts than in constitution "experts."

2. *Prolonged business sessions.* By and large, camera club members prefer to have the club's business affairs conducted and consummated by the officers and executive committee. Sometimes, and necessarily, the opinions and the decision of the membership must be polled. Such occasions may be limited to matters of outstanding importance directly affecting every member of the club. Members may be kept informed of the decisions and acts of the officers and executive committee by frequent reports, made either at meetings or in the club publications, or by inviting members to attend the committee meetings.

3. *Failure of club managements to report on the organization's financial status.* It is human nature to be suspicious of the handling of funds by others. Brief and simple reports by the club treasurer, from time to time, revealing how much money has been received, how much has been spent and for what, and how much is left, contribute to member confidence in and satisfaction with club management.

4. *Expendng club funds or incurring expenses for projects by which all members cannot benefit.* Special projects in which only a few members participate advisably may be separately planned and financed. Second only to expending their funds on projects in which they do not, or cannot, participate, members resent failure to invite their participation. Many of them may have no interest whatsoever in the proposed special projects, but still desire to be invited.

5. *Autocratic management.* The camera club is, fundamentally, a democratic organization, operated by and for its members. Management advisably may exercise leadership, but with such diplomacy that the club's activities appear to be the outcome of the expressed desires and interests of the members. In no case should any policy be followed when it is found to conflict with members' wishes.

6. *Monopolization of club management, meetings, programs, and other activities by a clique.* However helpful any clique or group within a club may be, and however much time it devotes to club affairs, it monopolizes, or leads members to suspect it is monopolizing, the club program only to the end of dissatisfaction. Those camera clubs are the more successful which encourage and promote the widest possible participation by club members in the program, activities, direction, and work of the club, and which limit the term of all officers.

7. *Dull meetings.* Promotion of a camera club program, and especially the planning and conduct of club meetings, primarily is "show-business." Club members desire training and education in photography, but prefer it in the guise of entertainment. Uninspiring speakers, overly-technical lectures, uninteresting subjects, and monotonous programs can be fatal. The well-rounded meeting program is balanced by elements of education and entertainment, serious business and fun, enlightenment and enjoyment, and certainly can end with a social period. Preferably the meeting program so may be planned and conducted that the members are convinced that (1) they have had an enjoyable evening, (2) they have learned something they can apply to their own camera work with benefit, and (3) they have been in the company of pleasant, interesting people.

8. *Monotony.* One of the serious problems of camera club management is the development of programs which avoid any tendency to become monotonous by (1) following unchanging routine, (2) doing the same things in the same way at the same time every meeting, and (3) lacking the element of surprise.

9. *Prolonged argument.* Argument, particularly over those phases of art which are, always have been, and probably always will be, matters of taste and of the times, are essential—and sometimes enjoyable—parts of camera club meetings and life. However, club management diplomatically may bring to an end argument which tends to become prolonged, futile, or bitter.

10. *Dissension.* Dissension which arises from the divergent interests of club members, or of groups of members, beneficially may be turned into constructive channels by organizing the members and groups for participation in activities which will give outlet to their energies.

What to Seek . . .

There is no one formula for success in camera club work other than that of giving members what they want, or of inducing them to like what they get. However, a number of clubs can ascribe their success to such undertakings as:

1. *Interesting meetings.* Talented, entertaining speakers, who teach as they talk, demonstrate how they do their work, and inspire and encourage club members to emulate their example, usually bring the members back in numbers to the next meeting.

2. *Enjoyable activities.* Club activities which the members thoroughly enjoy and from which they benefit photographically make for an energetic, active, and progressive club membership.

3. *Social enjoyment.* The vast majority of amateurs, and especially club members, desire to *enjoy* photography. To this end every meeting may have a social period during which members informally may assemble and discuss subjects of mutual interest. Some clubs invite members to have dinner together before the meeting, get together for a snack in some convenient place after the meeting, usually with the speaker of the evening as guest, and make eating and talking together a feature of every club activity whenever possible.

4. *Change of routine.* Changes in programs, particularly when they produce interesting and enjoyable surprises, always are helpful in maintaining club spirit and member interest. Rearranging the order of the meeting, rotating the official personnel as presiding officers, and, particularly, inviting some member to make an impromptu presentation, all are helpful means to this end.

5. *Comfortable meeting rooms.* Meeting rooms which are attractive and comfortable contribute immeasurably to member enjoyment of club programs. The best facilities the club can afford are none too good for members.

6. *Progressive improvement of members' abilities.* Arrangement of club meetings and activities programs in such a way that members are led to make progress photographically contributes to development of the club.

7. *Frequent displays of members' work.* Club members are usually proud of their photographic accomplishments, especially those developed through club activities, and ways and means may be found, possibly through frequent displays of members' work, to provide outlets for this pride of achievement.

8. *Fairness to all members.* All members, whatever their talents, admire and desire fair treatment. This end sometimes is difficult to attain but its observance is most important.

9. *Commendation of members.* Achievements of members, particularly photographic honors won in exhibitions and elsewhere, properly may be recognized by the whole club and, with equal propriety, shared as a club accomplishment.

10. *Participation by members.* Member participation in all club programs and activities is a commendable way to maintain interest and to promote club spirit.

Whether the camera club has facilities for camera work, club rooms, meeting rooms, studio, darkroom, and extensive equipment depends largely upon the size of the club, its objectives, and its financing. Some of the most active

clubs have limited equipment and facilities. Other clubs have commodious, attractive, and well-equipped establishments maintained at a cost of some thousands of dollars annually.

Lack of extensive equipment need not be a handicap to an active club. On the other hand, availability of equipment and of facilities for the practice and enjoyment of photography can be a big asset. Acquisition of expensive club equipment and facilities calls for permanent organization and financing of a high order. Possibly this is a goal toward which every club may strive, but which only the more successful may obtain.

Club Finances

Club finances may be regarded as the financial means to the end of satisfactory and successful club programs, and of solvent clubs. How much income the club needs to finance its program governs the amount of dues the members must pay. The amount of dues the members are willing, or able, to pay, must gauge the extent of the club program.

A few long-established clubs have capital or endowments accumulated through the years, but the average club depends largely upon dues as its single, or major, source of income.

Some clubs derive income from initiation fees. Others do not. Some clubs have one general type of membership, members paying equal dues. Other clubs classify memberships and levy different dues accordingly. Active members pay higher dues than inactive members; resident members higher dues than non-resident members. Some clubs make provision for associate memberships, limiting privileges and dues accordingly.

Too many clubs make the mistake of keeping dues below subsistence levels in order to increase the size of memberships, with the result that they must sacrifice self-respect by begging or blackmailing programs and prizes. Camera clubs are not charity organizations and members should realize that there is nothing in the nature of photography which entitles them to free rent, free programs, commercially donated prizes, etc. Dues should be high enough to cover all legitimate expenses.

It is not difficult to establish what dues should be. Chief expenses are programs, prizes, rent, equipment, and bulletins.

In the course of a year, various types of program material will be used. For a club meeting monthly, ten or twelve programs must be planned. One or two of these might be from manufacturers' representatives demonstrating equipment or processes. One or two might be "canned" lectures from Eastman, Ansco, etc. These two types of material are obtained without cost because they are standard services provided by manufacturers as part of their advertising or sales budgets.

One or two programs might be from the PSA or from a local camera clubs association and consist of print or slide shows organized as instruction programs. The cost is usually low.

Then there may be two or three programs from among the membership, with no cost to the club.

That leaves several meetings for which outside speakers or judges are necessary. These will cost a minimum of \$3 each for transportation and dinner, or \$5 minimum if

on a fee basis. (In no case should an outsider be expected to consider the club as an object of charity.)

After outlining contemplated programs, it will be found that perhaps four or five speakers from outside are necessary, at a cost of \$15-\$25. There is the starting point for the budget. (Use the higher figure.)

Part of the budget may represent rent. For clubs meeting in members' homes (a perfectly good system for clubs with fewer than 15 or 20 members) there will be no cost here. Many clubs have dinner meetings, with the restaurant providing the meeting room as part of the arrangement and at no cost. Industrial clubs pay no rent; YMCA's, community centers, etc., provide meeting places where a camera club is considered a community affair. In short, most clubs do not need to pay rent. Wherever rent is necessary, the amount should be included in the budget.

Tangible recognition of members' photographic abilities requires prizes of some sort on an individual contest basis, a cumulative basis, or a combination of both. (Dealers should not be solicited to provide merchandise as prizes; in too many cases such solicitations become a form of blackmail.) Knowing the number of ribbons, medals, or trophies to be awarded during the year, the cost should be included in the budget.

If the club has 50 or more members, there should be a budget for a club bulletin. Finally, there is the cost of equipment and upkeep. Many of the smaller clubs borrow from members and this is awkward, it is satisfactory. Most clubs need an easel, light box, projector, screen, etc. Determine what is needed as a minimum, prorate the cost across several years, and include in the budget.

Add all the above items together, divide by the number of members, and the result is a good idea of how much dues per member should be. Add 10% to this figure, round out to an even sum, and set this as the preliminary figure, to be revised after a year's trial.

Dues will increase with number of meetings, with more ambitious programs, etc. But such changes should first be approved by the membership before translating into dues.

No club should have a surplus or reserve more than necessary to carry the club several months. Any accumulation greater than this represents services and benefits which members have paid for and not received.

Essential to the satisfactory financial operation of the camera club is the preparation in advance of an annual budget. The budget may be simple in form, providing for the guidance of club management. Such data as (1) estimated income and from what sources, (2) estimated expenditures and for what purposes, and (3) accounts receivable, accounts payable, and balance. The club budget serves as a financial chart for the club's operations.

The more successful clubs, with the guidance of their budget, plan to live within their income. If they want to expand they know that additional projects must be additionally financed, and preferably must be self-financing. That means that (1) dues must be increased, or (2) more members must be obtained, or (3) new projects must pay their own way.

(To be continued.)

THE PSYCHOPHYSICAL EVALUATION OF THE QUALITY OF PHOTOGRAPHIC REPRODUCTIONS

(PSA PROGRESS MEDAL LECTURE, OCTOBER, 1950)

LOYD A. JONES, HON. FPSA *

1. INTRODUCTION

THERE are many aspects of picture quality and diverse methods of evaluating them. It is quite impossible in a single treatise to deal with all of the variables which enter into this problem. In this discussion particular stress will be given to those methods that may be characterized as *psychophysical*, as distinguished from purely *physical* or *objective* methods.

A large proportion of the source material used in this presentation has already been published. An endeavor will be made, however, to present this information in somewhat different form from that previously used. There is a biblical warning against the placing of new wine in old bottles. However, as far as I am aware, Holy Writ does not frown upon the placing of old wine in new bottles. I sincerely hope that the content of this discussion poured from new bottles will prove to be, like a good old wine, moderately stimulating, and will not be found to have gone flat with age and hence possibly produce in my audience a feeling of lassitude or even deep slumber.

From a perusal of the literature it is obvious that the word "quality" is used in many different senses by different individuals and, in fact, by the same individual in referring to different aspects of a photographic reproduction. Thus, the term *quality* may be used in referring to the way the scene is lighted, and in this sense the quality depends upon the skill of the photographers in choosing the time of day and the camera position if the scene be an exterior one illuminated by natural light sources. Another aspect of the quality of a picture depends largely upon compositional factors, such as the character of the component parts of the scene, the position of these parts relative to each other within the scene space, balance of light and shade, etc. These, together with other similar factors, determine the *aesthetic* quality of a picture.

In this discussion the term *photographic quality* will be used in referring to the degree of perfection with which the photographic picture reproduces in the mind of the observer the subjective impression which he received when looking at the original. This definition cannot apply if the observer has not seen the original. However, such an observer, as a result of accumulated experience with similar objects, has acquired a definite impression (resulting from stored memory records of previous visual stimuli), in terms of which he can evaluate the quality of the photographic reproduction although he has never seen that particular object. According to this definition, quality is dependent upon the many variables involved in the processes of making the photographic reproduction, such



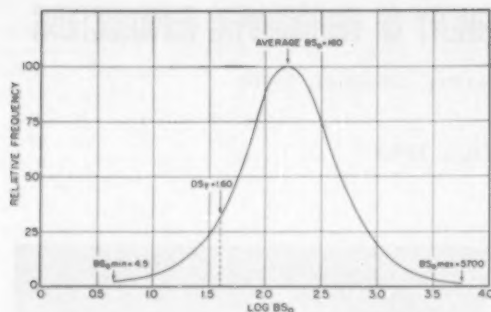
DR. LOYD A. JONES, HON. FPSA

as the characteristics of the negative and positive materials used, the exposure and processing of these materials, etc.

It seems reasonable to assume that this aspect of photographic quality is dependent largely upon the fidelity with which the subjective evaluation of *luminance* and *luminance differences*, produced in the mind of the observer when viewing the original, are reproduced in his mind when he views the reproduction. It is not safe, however, in all cases to assume that a precise reproduction of the original subjective impression is that which the observer would accept as "the best possible photographic quality"; he might be more pleased with a subjective impression into which some distortion has been introduced. This we may refer to as the "wishful thinking" or the "heart's desire" factor entering into the evaluation of reproduction quality.

From the *objective* point of view, a perfect photographic reproduction, which we may assume to be synonymous with perfect *objective quality*, is obtained when the *luminances* and *luminance differences* in the illuminated positive are identical with those in the object photographed. Such a positive, however, may fail to reproduce with satisfactory fidelity the subjective impression of the original because of the difference

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1. The relative frequency of occurrence of scenes having various luminance scales, log BS_0 .

(usually very great) between the visual field environment of the original and that of the positive as viewed.

The theoretical relationships and the practical methods required for computing in objective terms how closely the luminance and luminance differences in the original can be reproduced by a specific photographic process are well known. However, it is usually found impossible to obtain an exact objective reproduction with the available photographic materials. This is particularly true when the positives are made on reflecting surfaces, such as paper, that must be viewed by reflected light. The *magnitudes* and the *kinds* of compromises that will produce the least detrimental effect on the photographic quality of the positive cannot be determined by purely objective methods, but must necessarily be established in terms of their *subjective* effects.

The material to be presented in this paper will be concerned almost entirely with photographic quality obtainable by use of the "black-and-white" negative-positive photographic process, the positives being made on opaque white surfaces and viewed by reflected light.

2. LUMINANCE DISTRIBUTION IN EXTERIOR SCENES

It may be well to consider briefly the luminance characteristics of the objects of which photographic reproductions are to be made. We shall confine our attention almost entirely to those groupings of objects, which we may refer to as *scenes*, found out of doors and illuminated by combinations of sunlight and skylight. For our present purpose, the luminance characteristics of a scene are satisfactorily specified in terms of its *maximum luminance*, B_{0max} , *minimum luminance*, B_{0min} , and *luminance scale*, BS_0 . Luminance scale is defined as the ratio of the maximum luminance to the minimum luminance ($BS_0 = B_{0max}/B_{0min}$). For convenience, it is frequently desirable to express the luminance scale in its logarithmic form, $\log BS_0$. In a previous communication,¹ data on the luminance scales of 126 exterior scenes were given. These measurements were made at different hours of the day and were well distributed through a period of eighteen months. While the majority of these scenes were photographed under clear sunny conditions, a goodly proportion were photographed under other atmospheric conditions, such as haze, light cloud, heavy cloud, etc. Scenes were chosen at random in order to

obtain a fairly definite idea of the range in luminance scale encountered under normal exterior conditions. Since the publication mentioned, luminance measurements have been made on an additional 94 scenes. The results for the total of 220 scenes are given in Fig. 1 in the form of a curve showing the frequency of occurrence of the various values of $\log BS_0$. The average luminance scale is 160, which, incidentally, corresponds with the average found for the measurements previously published. The luminance scale varies from a minimum of 4.5 to a maximum of 5,700, about 90 percent having luminance scales between 25 and 1,000, there being relatively few scenes of extremely low or extremely high luminance scale. To illustrate the type of scene in which low, average, and high luminance scales are encountered, Figs. 2, 3, and 4 are shown, for which the luminance scales are 10, 160, and 1,460, respectively.

3. POSITIVE MATERIALS

There are available for use in making positives a rather wide variety of photographic papers, sometimes referred to as "developing-out papers." These may be classified as chloride, bromide, chlorobromide, contact, projection, and various other types, but this classification is of little significance for our present purpose, since we are interested primarily in the shape of the density-log exposure relationship of these materials. These papers are available in a variety of surfaces, ranging from dull matte to very glossy. Usually the manufacturer provides a series of *grades* within any given kind of material. In the amateur field in particular, it is customary to supply five or six grades of paper of a given surface characteristic, approximately constant with respect to *density scale*, DS_y , but varying over a considerable range with respect to the general steepness of the D-log E curve, and consequently with respect to the *average gradient*, \bar{G} , and *exposure scale*, ES_y .

Figure 5 serves to define two terms that will be used frequently in specifying the characteristics of positive materials. From the point A on the toe of the curve the dotted straight line is drawn tangent to the shoulder of the curve at the point B. The gradient at the point A is 0.10 of the gradient of the straight line through the points A and B, the slope of which gives the average gradient, \bar{G} , of that part of the characteristic curve lying between the points A and B. The *sensitometric exposure scale*, SES_y , of the material is defined as the distance between the points a and b, as indicated. The *density scale*, DS_y ,



2. Typical scene of low luminance scale, $BS_0 = 10$.



3. Typical scene having a medium luminance scale, $BS_0 = 160$.

of the material is defined as the distance between the densities corresponding to the points A and B.

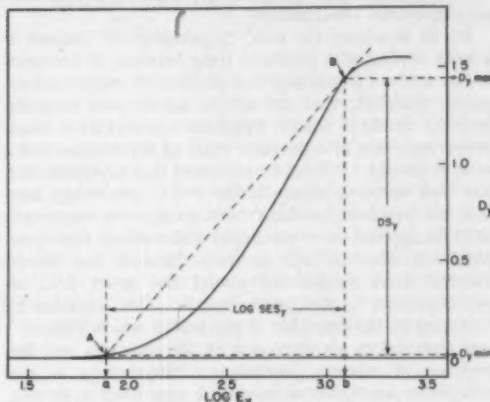
The curves in Fig. 6 are typical of a group of papers having a semimatte surface. The available maximum density is approximately 1.5, corresponding to a relative reflectance scale of 32, which means that the maximum reflectance is 32 times the minimum.

The value of sensitometric exposure scale decreases progressively from a maximum of 22.4 (for the No. 0 grade) to a minimum of 3.5 (for the No. 5 grade). There is little doubt that the value of *exposure scale* of a positive material is the most important single characteristic of such materials from the standpoint of "fitting" the positive material to a negative of known density scale.

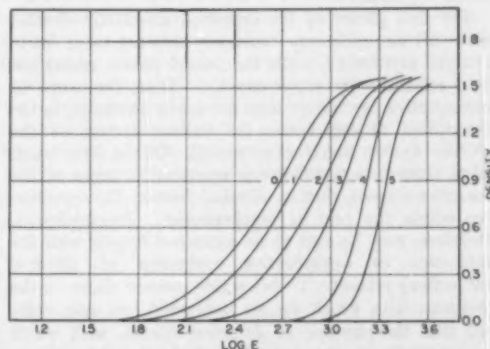
From what has been said concerning the characteristics of positive materials and of the scenes of which photographic reproductions are to be made, it is obvious that it is impossible to obtain perfect objective reproduction of the luminance characteristics, *luminance scale*, and, what is more important, the *luminance differences*, of the majority of these scenes. Figure 1, which shows the frequency of occurrence of scenes having various luminance scales, illustrates this. To obtain perfect objective reproduction of the luminance and luminance differences of a given scene, the positive material must have an available density scale equal to the logarithm of the luminance scale, $\log BS_0$, of the scene. The dotted vertical line is located at a value of $\log BS_0$ equal to 1.6, which is a fair average of the density scale available in photographic printing paper (including matte, semimatte, glossy, etc.). This means that all of the scenes falling to the right of the line, if reproduced on such a positive material, will, of necessity, require some kind of compression of their luminance scales. If a part of the luminance scale is rendered with the correct values of luminance differences, we must accept compressed rendering or the complete loss of rendering of luminance differences at other parts of the tonal scale. The problem which arises in obtaining the best possible photographic quality involves the determination of the *magnitudes* and the *kinds* of compromises that must be made with perfect objective tone reproduction. As far as I am aware, there is no purely objective method which will predict with certainty, for all possible combinations of circumstances, the magnitudes and kinds of compromises that will result



4. Typical scene having high luminance scale, $BS_0 = 1460$.



5. The D-log E curve of a positive material (white opaque paper base). This illustrates the definition of sensitometric exposure scale, $\log SES_y$, and maximum density, D_y , as used in this paper.



6. D-log E curves for a series of six grades of a positive material (printing paper) having a semimatte surface. (D_{max} approximately 1.5.)

in a positive having the best possible photographic quality. These circumstances include the visual conditions which exist when the observer at the camera position looks at the scene in its total visual environment, as well as those conditions which exist later when he sees the photographic reproduction in its *total* visual environment. Perhaps we should say also at this point that, in

the case of scenes having luminance scales less than the available density scale of the positive material, there is no assurance that perfect objective reproduction of luminance and luminance differences will yield the most satisfactory positive. In fact, there are many cases where we know that the perfect objective reproduction, although obtainable, is not the one the majority of judges will choose as of best photographic quality.

4. PSYCHOPHYSICS AND PSYCHOPHYSICAL RELATIONSHIPS

Since there may be some who are unfamiliar with the scope of the science commonly referred to as *psychophysics*, it may be well to discuss briefly and in general terms the definition and significance of psychophysics and psychophysical relationships.

By its structure, the word "psychophysics" denotes a science dealing with problems lying between, or common to, the fields of psychology and physics. It might be supposed, therefore, that the subject matter and methods involved should be equally well known to workers in these two broad fields of endeavor. Such an assumption, however, is invalid. It must be confessed that psychophysics has been nurtured largely in the fold of psychology and that the psychologists have been much more concerned with the application of psychophysical methods than have physicists who, perhaps to their discredit and disadvantage, have surrendered almost the entire field of psychophysics to the psychologists. This situation is indicated by the definition of psychology which Troland² has proposed in his discussion of the problems and the methods of modern psychology: "Psychology is the *systematic description of immediate experience in its own terms*, and the formulation of its manner of determination by features of the *physical system*, or in other demonstrable factors lying *outside* experience itself." (The italics are mine.)

The first phrase of the definition manifestly denotes that part of psychology commonly referred to as *introspective psychology*, while the second phrase covers the field embraced by *psychophysics*. Thus, the scope of introspective psychology does not use or recognize, in the description of experience, the various factors of the physical system which act as stimuli. On the other hand, when immediate *experience* is expressed in terms of the *causative stimuli*, that is, *physical factors*, the operation lies within the field of psychophysics. Psychophysics, therefore, may be said to be concerned largely with the *subjective* or *introspective* evaluation of *physical* (objective) stimuli. To bring this concept closer to the problems with which we are concerned, we may point out that the physical or objective stimuli, with which we are dealing in the evaluation of photographic quality, are those elements of the photographic process which are involved in the reproduction of the luminances and luminance differences of a scene by means of a distribution of various reflectances on a sheet of paper. The light reflected from this photographic reproduction and entering the observer's eye constitutes the immediate *physical stimulus*. Through the medium of the visual system, certain subjective phenomena, such as sensation, perception, etc., are aroused in the consciousness of the

observer. These we may refer to as the *subjective* responses. The evaluation of the physical stimuli in terms of these subjective responses constitutes a psychophysical evaluation, and the relationships established between the various physical constituents of the stimuli and the resulting subjective responses are termed *psychophysical relationships*. Thus, psychophysics is concerned with the formulation of relations between the various elements of the physical processes and one or more of the subjective (psychical) responses.

Perhaps it is not possible to describe with certainty all of the mental activities involved on the subjective (psychical) side of the psychophysical relationship, although the physical aspect can be intimately identified with the complicated physical stimulus category. There is little justification for the position adopted by some that the science of psychophysics is limited to relationships between physical factors and *sensory* response. Fechner, who may be considered as the father or the founder of the science of psychophysics, has given the definition assigning its scope. Titchener, an eminent and respected psychologist, points out that, as thus defined, the sphere of psychophysics is as broad as that of psychology and that consequently there will be a psychophysics of sensation, of perception, of feeling, of action, of attention, etc.

In many discussions of the theory of tone reproduction, reference is made to the use of certain psychophysical relationships for the prediction of the character of the subjective responses arising in the consciousness of the observer when a photographic reproduction of known objective tone reproduction characteristics is viewed. These psychophysical relations pertain almost entirely to that feature of the human visual system which is commonly designated as *contrast sensitivity*, which means sensitivity to *luminance differences*. The difficulty in using these psychophysical relationships with certainty lies in the fact that the relationship between stimulus and response is dependent upon such a complicated multiplicity of factors that the predictions based upon such relationships are of questionable validity.

To cite a specific instance, the sensitivity of the eye to luminance differences varies over a wide range, depending upon the distribution of luminance in the whole visual field, and particularly upon the luminance of that particular part of a scene (or a photographic reproduction thereof) on which attention is fixed at any moment. It appears that the contrast sensitivity of the visual mechanism is determined largely by the illuminance incident upon the foveal region of the retina. The value of this approach to the solution of the subjective aspect of the tone reproduction problem should not be underestimated. It is likely that when the mode of functioning of the human visual mechanism is more clearly understood it will be possible to predict, from analytical methods of treatment, the photographic quality of a photographic reproduction of known objective characteristics. However, in my opinion, the fundamental data on this subject are not at present sufficiently voluminous, or perhaps I should say sufficiently comprehensive, to make it unnecessary to use also, at least for some purposes, a direct psychophysical approach to the evaluation of photographic quality.

Typical Data. Judgment of Relative Print Quality

Observer	Position in Series											
	1	2	3	4	5	6	7	8	9	10	11	12
Print Number												
1	1	2	3	4	5	6	7	11	8	9	12	10
	1	2	3	4	5	6	7	8	11	9	10	12
	1	2	3	4	5	6	7	11	9	8	12	10
2	1	2	3	4	5	6	7	10	9	12	8	11
	1	2	3	4	5	6	10	9	7	12	11	8
	1	2	3	4	5	6	7	11	12	10	9	8
3	1	2	3	4	5	6	7	11	8	9	12	10
	1	2	3	4	5	6	7	11	12	10	9	8
	1	2	3	4	5	6	7	11	12	10	9	8
4	1	2	3	4	5	6	7	11	12	10	9	8
	1	2	3	4	5	6	7	12	11	8	9	10
	1	2	3	4	5	6	7	12	11	8	9	10

TABLE I.

5. DEPENDENCE OF PHOTOGRAPHIC QUALITY ON NEGATIVE EXPOSURE

We shall now illustrate a psychophysical method whereby the dependence of the photographic quality of a positive upon one of the many factors involved in the making of a picture may be determined.³ The variable which is chosen for this purpose is the exposure given to the negative material in the camera, that is, the *camera exposure*.⁴ A series of twelve negatives is made of a chosen scene (Fig. 7), beginning with the camera exposure so small as to result in a badly underexposed negative. The camera exposure is then increased by approximately equal steps in log E, and covering a total range of 1 to 64 in camera exposure. These negatives are given identical development, and from each negative the best possible print is made by using the most suitable grade of positive material chosen from a group similar to that shown in Fig. 8.

It is not possible to predict precisely from objective data which of these grades will result in the best possible print quality; this is determined by the method illustrated in Fig. 9. A series of prints is made on a paper grade which it is estimated will yield prints somewhat too "soft." Printing exposure is varied by small and equal increments from a minimum value yielding a positive that is obviously too light to a maximum sufficiently great to give a positive that is obviously too dark. The same negative is then printed on the next higher grade number of the positive material and, again, on a third, and sometimes on a fourth grade. All prints are given the same processing treatment.

These prints are then assembled on a uniformly illuminated judging easel, as illustrated in Fig. 9, and examined by a large group of observers. Each judge chooses the positive having the best photographic quality. By averaging all of the judgment data, the best positive for each of the negatives is identified.

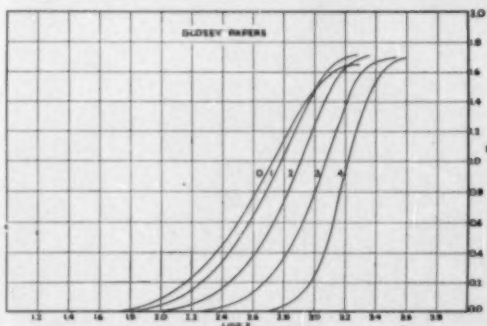
It now remains to determine the relative photographic quality of the best prints made from each of the negatives. This is accomplished by a second series of judgments, again of a purely subjective nature. The twelve prints are given to a judge in random order, without identification marking of any kind. This is illustrated schematically in Fig. 10. The judges arrange these prints in a horizontal row, placing the print of lowest photographic



7. Scene ($BS_0 = 160$) used to illustrate the determination of the effective camera speed of the negative material by the psychophysical method.

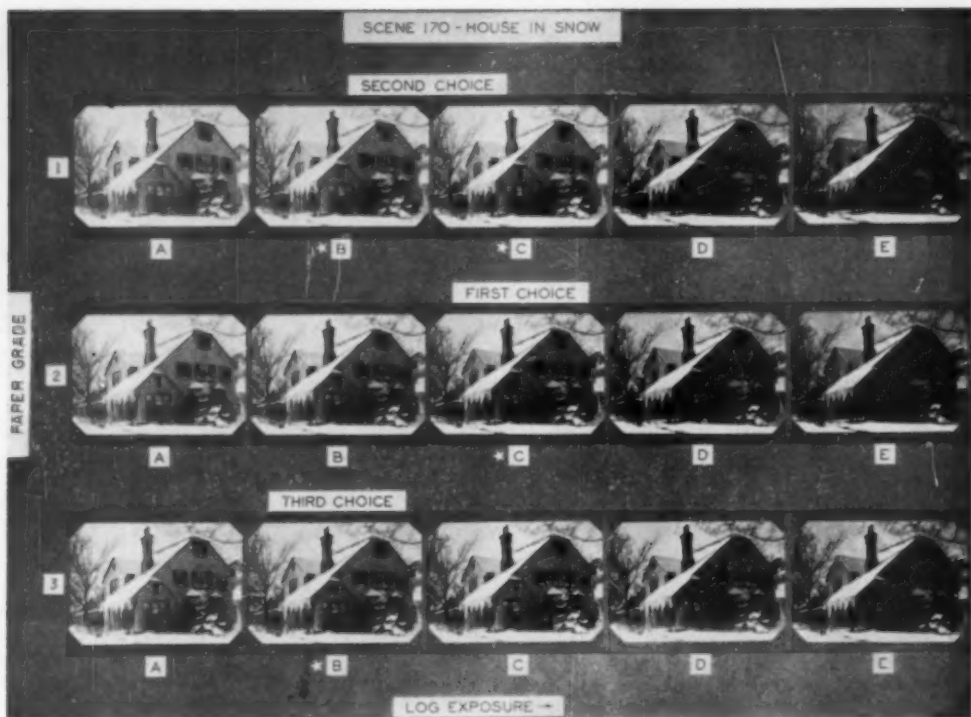
quality at the extreme left and the remainder of the prints, in the order of increasing photographic quality, to the right. Figure 11 illustrates the result of such a judgment procedure. The numbers at the top of each print indicate the number of the negative from which the print was made. The numbers at the bottom of these prints represent the order in which they were arranged by one judge on one occasion. These are merely ordinal numbers. This arrangement is the result of an introspective process, "the systematic description of experience in its own terms." However, when these ordinal numbers are replaced by a numerical value representing some aspect of the stimulus process (in this case, camera exposure), a psychophysical relationship is obtained.

Table I shows some typical examples of the results of such judgments. It will be seen that there is no doubt concerning the relative qualities of the prints made from the first six negatives. In the case of the print from negative No. 7, there is a little uncertainty. With the prints from the negatives 8 to 12, inclusive, it is found that an observer cannot repeat his sequential arrangement on different occasions, and, moreover, observers do not agree concerning the relative quality of prints from these negatives. A simple arithmetic technique is used for obtaining a numerical rating of the relative quality of these prints as determined by the average of all of the judgment data (50 series of judgments by 30 observers).



8. D-log E curves of five grades of printing paper (D_{max} approximately 1.6) having a glossy surface used for making prints from negatives of the scene shown in Fig. 7.

* Camera exposure, CE, is defined as a ratio of the exposure time, t , to the square of the aperture ratio, f : $CE = t/f^2$.

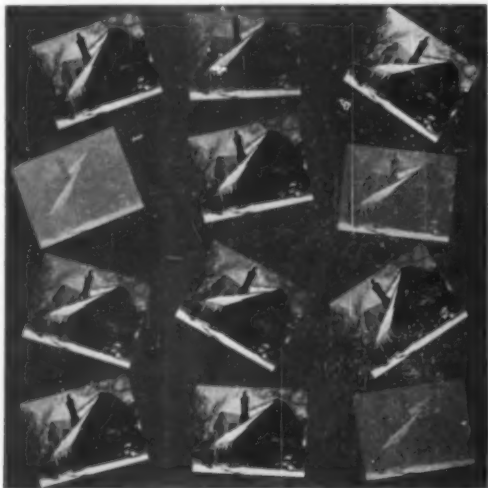


9. Three groups of prints assembled on the judging easel. Printing exposure variable in the horizontal direction, and paper grade in the vertical direction.

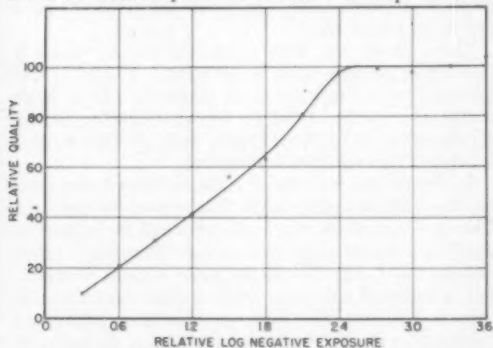
The final relative quality rating is shown graphically in Fig. 12. The relative quality increases rather slowly with increasing camera exposure, then rises more rapidly to the rating values which oscillate about a horizontal line representing constant quality. This method gives no valid

indication of the *magnitude* of the quality differences between adjacent positives in the region of low camera exposure. The randomness of the placing of the positives made from negatives 8 to 12, inclusive, shows that the *photographic quality differences* existing within this group of positives is less than a *definitely perceptible* quality difference.

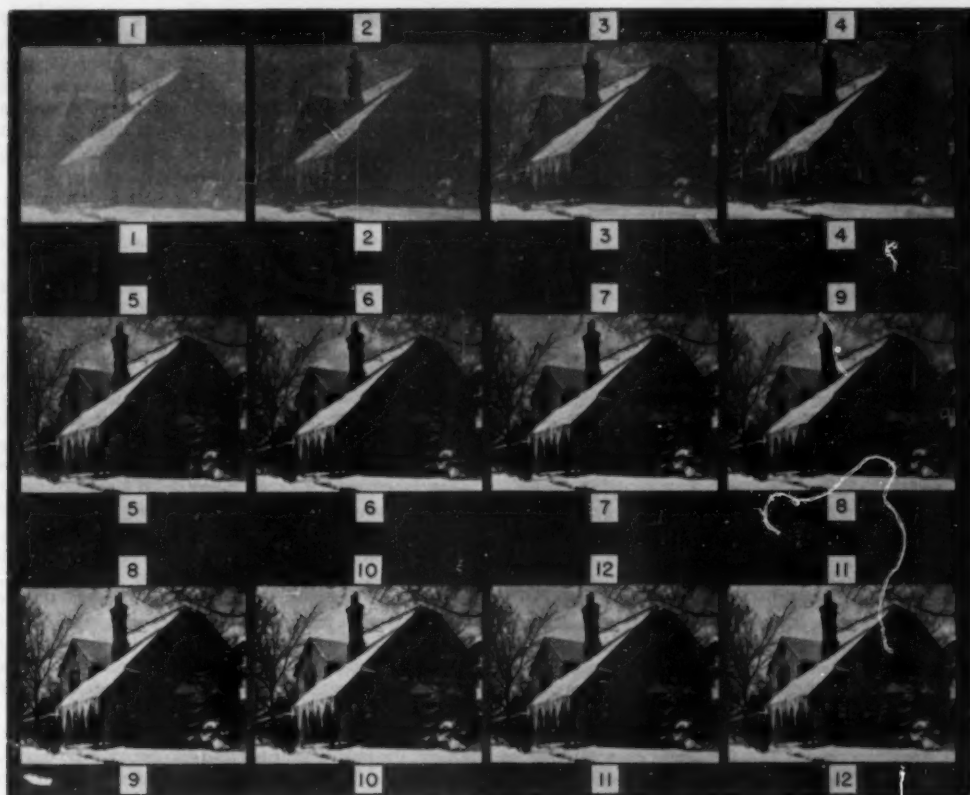
The *minimum camera exposure* corresponding to the horizontal portion of this relative quality curve is the *least camera exposure which will result in a negative from which an excellent print can be made*. Perhaps the term



10. Positives resulting from variation in printing exposure as presented to the judges in random order.



12. Relative photographic quality of positives as dependent upon the camera exposure given to each of the twelve test negatives.



11. Positives arranged by one judge on one occasion in order of increasing photographic quality from left to right.

excellent should be replaced by *best possible* or *optimal*, since we specifically mean to convey the impression that this photographic quality is the best that can be obtained with this particular negative material when used with a specified group of positive materials.

A number of series of such experimental procedures were carried through, employing negative materials, differing widely in speed and curve shape, and groups of positive materials (on which the prints are made) representing the entire gamut of those which are commercially available. It is upon a large volume of data of this type that our present method of measuring and specifying the *effective camera speed* and *exposure index* of negative materials is based.

This method, which is based on the "fractional-gradient criterion" as used in practice, employs a purely sensitometric procedure and hence is an objective method which does not involve the laborious and time-consuming procedure of making negatives, prints, and the judgment of photographic quality by a large group of observers. It is important, however, to keep in mind that this method gives true values of *effective camera speed* only because such values are in close agreement with speed values based upon the least camera exposure, *determined psychophysically*, which yields negatives from which prints of excellent quality can be made.

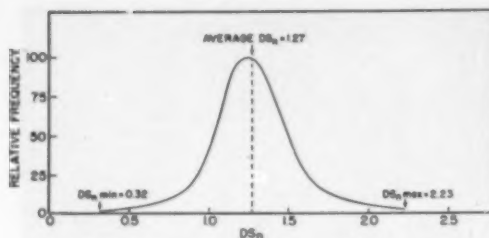
PSA JOURNAL, Vol. 17, Dec. 1951

6. CORRELATION BETWEEN NEGATIVE DENSITY SCALE AND THE EXPOSURE SCALE OF THE POSITIVE MATERIALS

Thus far we have discussed the psychophysical relationship between a single variable, camera exposure, which is one of the relevant variables of the physical stimulus process, and the subjective response, the relative photographic quality of the positive. Other elements of the physical stimulus process may be correlated with photographic quality, thus yielding relationships which assist in the solution of other important photographic problems.

We shall now illustrate the results obtained by the use of a psychophysical method for establishing the relationship between the density scale of negatives and the sensitometric exposure scales of positive materials which yields positives of optimal photographic quality.⁴

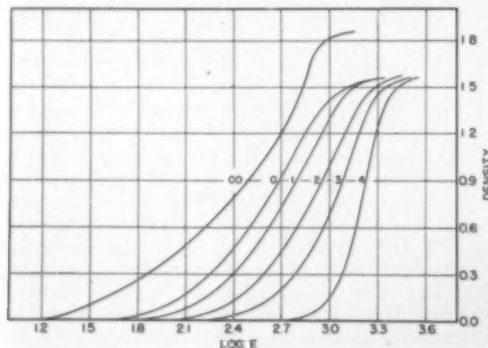
For this purpose, a group of 170 negatives will be used, all of which had received appreciably more camera exposure than the minimum required to produce a negative from which a print of optimal quality can be made. All were given normal ($\gamma = 0.8$ approximately) and identical development. Under these conditions the density scale in each case is determined largely by the luminance scale, BS_0 , of the object. It is true that the amount of flare light present in the camera when the



13. Relative frequency of occurrence of negative density scale, DS_n , of the group of 170 negatives used for the psychophysical determination of best grade of positive material and optimal printing exposure.

negative material is exposed has some effect upon the density scale of the resulting negative, even though the camera exposure and development were as specified. This effect, however, is relatively small compared to the wide range in the luminance scales of scenes photographed, and hence the latter factor controls largely the density scales of the resulting negatives. This group of negatives includes the 126 negatives of exterior scenes, concerning which detailed information has already been published.¹ To these were added an additional 44 negatives, all of which may be described as of the informal out-door portrait type. These 170 negatives represent quite faithfully a cross section of the subject matter of which out-door pictures are taken, such as distant and semidistant landscapes, gardens, people (singly or in groups) close to and moderately distant from the camera, flowers, trees, mountains, snow scenes, etc. The maximum and minimum negative densities (D_{nmax} and D_{nmin}) of all negatives were measured. The frequency of occurrence of the various values of density scale is shown in Fig. 13. The minimum DS_n is 0.32; the maximum, 2.23; and the average, 1.27.

Positives were made by using a group of printing papers having a semimatte surface, the D-log E characteristics of which are illustrated in Fig. 14. The grades indicated by the numbers 0 to 4, inclusive, have density scales of approximately 1.45. These curves vary in steepness progressively through the series from 0 to 4, the log SES_7 values measuring from 1.35 to 0.54. The curve 00 represents a material which was necessary for obtain-



14. D-log E curves of six grades of positive material varying with respect to sensitometric exposure scale.

ing prints of excellent quality from a relatively few negatives which had very high values of density scale. When this work was done, no paper was available having a semimatte surface and a sufficiently great exposure scale to accommodate these negatives, so this glossy surface material (log $SES_7 = 1.78$ and $DS_7 = 1.75$) having a curve shape appreciably different from Nos. 0 to 4, inclusive, was used when required.

A group of positives was made from each negative. The operator making these prints estimated the grade most likely to give the print of best possible quality. If it appeared that a given negative would probably be satisfactorily fitted by grade 3, he made a series of prints on grades 2, 3, and 4. In some cases the operator's original judgment was faulty so it was necessary to make sets of prints on a fourth or even a fifth grade of paper. In work of this kind where judgments of print quality must be made, it is necessary that one grade which the exposure scale is definitely too small to fit the negative be used. Otherwise, the judge might feel a little uncertain in making a final decision as to whether a grade having a lower or a higher exposure scale would have yielded a print of better photographic quality than those actually placed before him.

On each of the grades at least five prints were made, with printing exposure steps increasing uniformly, the step interval being approximately that required to give two or three just perceptible differences in lightness. The least printing exposure was such as to give a print obviously too light, while the maximum printing exposure gave a print obviously too dark. A typical group of such prints is illustrated in Fig. 9.

We come now to a very important aspect of this work, namely, the judgment of the relative photographic quality of the prints in each group. In order that the estimates of quality obtained from a group of judges shall be significant, the conditions of observation and judging must be carefully and completely standardized. It is well known to workers in the field of psychophysics that the conditions under which judgments are made may influence profoundly the results. Care was therefore exercised in the design of a judging easel on which prints were placed for observation. The entire surface of the easel was covered with a gray cloth of median reflectance and was illuminated uniformly by an overhead bank of fluorescent daylight lamps. The illuminance incident on the plane of the easel was approximately 200 foot-candles. This level is considerably above that usually encountered in viewing photographs at night, but appreciably lower than that in well-illuminated interiors during daylight hours, and appears to be a reasonable compromise between the widely varying conditions under which photographic prints are commonly viewed.

In previous work of this kind it has been found, not only by us but by other workers in the field of psychophysics, that if two or more judges are permitted to examine a group of prints simultaneously, they invariably influence each other with regard to the choice of specified qualities. Such practice, therefore, must be avoided if the final statistical result is to have maximum significance.

No record of the grade number or the printing exposure was visible to the judges.

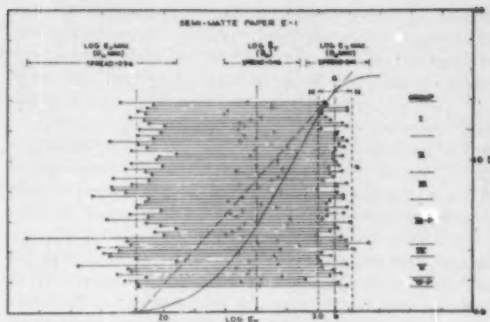
Judges were selected who did not have intimate

knowledge of the technical details involved in making prints. While they may have known in a general way the object of the experiment, actual information as to the maximum and minimum print densities and relationships of these to the characteristic curves of the materials, the printing times, or other relevant factors was not available to them.

The same instructions were given to each judge. The attendant, whose duty was to record the judgment and the necessary data relating thereto, was careful to avoid influencing in any way the observers' judgments by any comments as to the choices of previous judges, his own opinion, etc.

A judge was first instructed to select from one of the horizontal rows, for instance, No. 1 in Fig. 9, the print which to him exhibited the best photographic quality. The variable in this row of prints, as stated previously, is printing exposure. The first judgment, therefore, related to the printing exposure giving the best photographic quality. If the judge happened to be particularly critical, he might have preferred a print intermediate in lightness between two of the actual prints, for instance, lighter than C but darker than B in row No. 1. In this case, the attendant made a record of this judgment and the preferred printing time for the best possible print was obtained by interpolation. The judge then chose the best print in each of the other two rows, which, of course, were made on two additional grades of the printing paper being used. In many cases, it was exceedingly difficult for a judge to decide between two adjacent grades. He was therefore asked to indicate not only a first choice but also a second and a third choice.

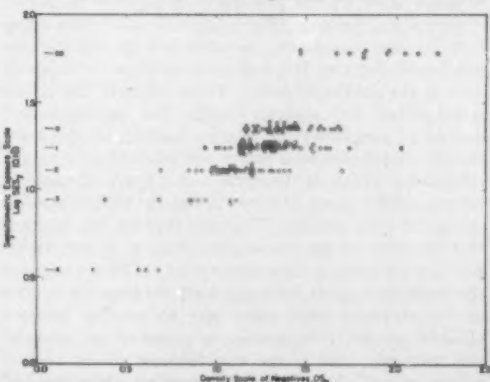
In the particular case shown in Fig. 9, one observer expressed an opinion that the correct printing time in the lower row was represented by print B, by print C in the middle row, and by a print half way between B and C in the upper row. His judgment concerning the best photographic quality gave first choice to paper grade 2, second choice to grade 1, and third choice to grade 3. Thus, in the opinion of this observer, print C on grade 2 represents the best photographic quality it is possible to obtain from this negative on any one of the grades of six positive materials. Each group of prints from the 170 negatives was judged by 30 observers, the final result being groups of 170 first-choice, second-choice, and third-choice prints.* Measurements of the maximum and minimum densities (D_{\max} and D_{\min}) were made on all positives. The results for the first-choice prints made on the No. 1 grade of paper are shown in Fig. 15. The sensitometric curve is derived from an average of all of the data obtained from the sensitometric strips developed with each of the 62 first-choice prints made on this particular grade of paper.⁴ Each horizontal line represents a first-choice print. The extremity to the right, when projected on the D-log E curve, indicates the maximum print density, and, when dropped to the log E_T axis, gives the value of the maximum exposure, $E_{T\max}$, incident on the positive material. The extremity of the line to the left gives D_{\min} and log $E_{T\min}$. The black



15. Relationship between the density scales of the negatives from which the 62 first-choice prints were made on paper grade No. 1, and the log exposure scale of the positive material.

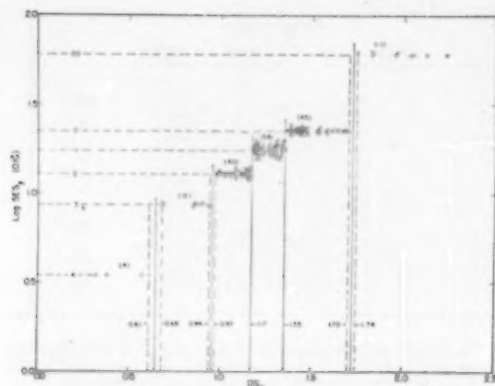
dots representing the values of log $E_{T\max}$, and hence corresponding to the lowest luminance of the scene, cluster rather closely about a vertical line drawn through the tangent point, a, on the characteristic curve. The average value of log $E_{T\max}$ for this group of first-choice prints is 3.11, which is practically identical to the log E_T value for the tangent point, a, on the shoulder of the curve, which was 3.12. The black dots terminating the horizontal lines to the left in the figure are dispersed widely about the vertical line through the 0.1G point. In many cases, these extremities lie far to the left of the point at which the characteristic curve terminates. This means that, in many cases, a considerable amount of highlight detail is sacrificed in the first-choice print. The average loss of detail at the shadow end of the tonal scale is much less. This conclusion should not be interpreted as indicating that the limiting gradient in the shadow region is the unique determining factor of first-choice print quality. It may be, and this seems likely, that those parts of the tonal scale of greatest importance in the determination of photographic quality correlate more closely with the minimum luminance than they do with the maximum luminance of the scene.

Figure 16 shows graphically the results of judgment data on all of the first-choice prints. Each small circle



16. This chart shows the relationship between the negative density scales from which first-choice prints were made and the grade of printing paper used therefor.

* A sufficient number of paper grades must be used so an observer can always be satisfied that a "harder" or "softer" grade would not produce better photographic quality than the grade which he has chosen as best. To achieve this end, it was in some cases necessary to make a series of variable printing exposures on more than three grades of positive material.



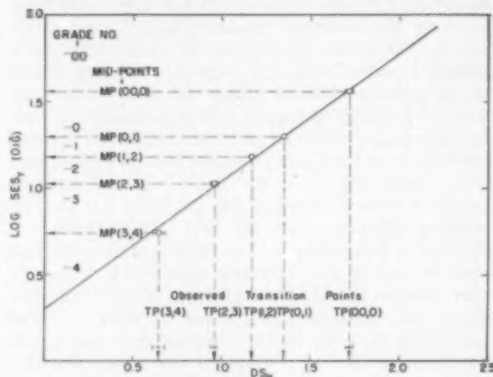
17. Chart showing the results of a second psychophysical judgment of the first-, second-, and third-choice prints modified to give a unique relationship between log SES_p and DS_n .

represents a print of first-choice quality, and the co-ordinates give the values of DS_n and of log SES_p of the positive material. It is evident that there is no unique relationship between these two variables, and hence the value of negative density scale cannot be an unambiguous guide for the selection of the grade of paper to be used in making a print of first-choice quality.

The situation is not nearly as bad as appears on the surface, because second-choice prints are in practically all cases high-quality prints. This is especially true for prints made from negatives which lie in the region of transition from one paper grade to another. An examination of the print scores derived from the average judgment data indicates that in a good many cases the second-choice print may have a score almost as high as the first-choice.* It is obvious, therefore, that in cases of this kind, and these occur frequently, a second-choice print can be substituted for a first-choice print without materially lowering the average photographic quality of the whole group of 170 positives.

In order to make the information we have obtained a useful guide for choosing the paper of known sensitometric exposure scale for the printing of a negative of known density scale, the ambiguous relation shown in this figure must in some manner be converted into an unambiguous relationship between DS_n and some aspect of the exposure scale of the positive material. In our opinion, this is best accomplished by applying again the psychophysical method of comparing the relative qualities of the first-, second-, and third-choice prints, and establishing a unique relationship which, in the opinion of a group of qualified judges, yields a group of prints having the highest possible average of print quality. This was done by the substitution for some of the first-choice prints a second-choice, and in a few cases, a third-choice print. This necessitated the transfer of prints back and forth between the various grades of paper until there was no overlap between adjacent groups. The average judgment of our group of observers was used in the establishment of the desired unique groups. In making the transfers which resulted in the formation of unique groups, the fundamental aim

was to sacrifice as little as possible in the average photographic quality of the final group of prints as compared to the average photographic quality of the entire group (170 prints) of the first-choice prints. In this process, two subordinate principles were followed: (a) The total number of transfers from one paper grade to another should be as small as possible, and (b) the number of transfers involving the increase in the grade number should be balanced as closely as possible by an equal number of transfers to a lower grade number. The result of this second psychophysical judgment process is shown in Fig. 17. Thus, we have established a series of transition points, TP, on the DS_n scale which indicate at what value of DS_n the change from one grade of positive mate-



18. The relationship of the transition points between adjacent grades of paper and the midpoints between the log SES_p values for adjacent grades.

rial to another must be made.⁸ In Fig. 18 is shown in graphic form the relation between these psychophysically determined transition points and the midpoints, MP, between each pair of adjacent grades of the six positive materials used in this experiment. The relationship can be represented quite satisfactorily by a straight line, the equation of which is

$$DS_n = 1.35 \log SES_p - 0.40. \quad (1)$$

The analytical expression or its graphic equivalent may now be used as a guide for the printing of a large number of negatives having known density scales on these six positive materials, in order to obtain a group of prints having the highest possible average photographic quality which is compatible with a unique relationship between DS_n and log SES_p . The heavy horizontal lines (Fig. 19), labeled 00 to 4, inclusive, show the range of DS_n values of the negatives which are printed on each of the six grades of positive material.

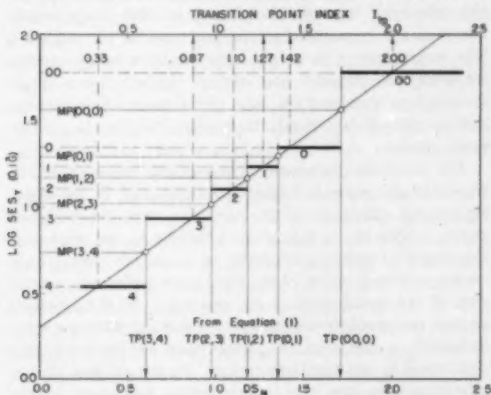
The values of log SES_p are unique characteristics of the positive materials since they are measured by a purely objective sensitometric method and are entirely independent of the characteristics of negatives being printed. The transition points, as determined by this psychophysical method, are independent of the frequency of occurrence of the different values of DS_n within the group of negatives used in their determination. It is therefore immaterial whether a new group of negatives to be printed has a frequency characteristic, with respect to

* For example, see Table XVII, page 604 of Reference 4.

DS_n , the same as, or vastly different from, that existing in the group of negatives which we used.

If a different group of positive materials is to be used, new transition points must be determined. This can be done quite simply by using the relationship represented by the analytical expression just quoted. The method followed may be either graphical or analytical, as desired. The graphical method is illustrated in Fig. 20 where the straight line is that represented by equation (1). The log SES_n values of four hypothetical materials having the grade numbers a, b, c, d, are plotted on the ordinate scale at the left. The midpoint between each adjacent pairs of these positive materials is determined. The horizontal lines drawn intersect the straight line, and from that intersection point perpendicular lines are dropped to the abscissa scale, thus determining the transition points, as indicated. If additional positive materials are used covering the lower and higher log SES_n values, the same procedure is followed until all of the desired transition points are located. From now on the use of the graphical solution is the same as that discussed in Fig. 19.

There is a slightly different method illustrated in this figure for obtaining transition points which, in some applications, is even simpler.⁵ Along the top of this figure has been established a scale numerically identical with the ordinate scale at the left. This is designated as a scale of transition point index, I_{tp} . Horizontal lines drawn through the values of log SES_n (of the four hypothetical papers a, b, c, and d) on the ordinate scale at the left intersect the straight-line function, and from



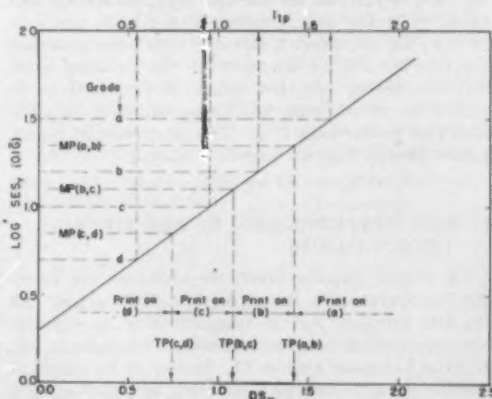
19. The heavy black lines show the range of negative density scales which, according to the psychophysical relationship established in Fig. 18, must be printed on each of the six grades of paper used.

these intersection points vertical lines drawn upward establish points on the scale of I_{tp} . These values are designated as *transition point indices*, I_{tp} , for the respective positive materials. These values may be used for computing directly the desired transition point between any pair of positive materials, since it is only necessary to take the average value of the transition point indices for any pair of adjacent positive materials. These values of I_{tp} are unique characteristics of each positive material. They depend for their magnitude only on the relationship represented by the straight line in this and the previous

two figures. They are not dependent upon the number and spacing of the positive materials which compose the group being used in printing, nor are they dependent upon the frequency distribution of the density scales within the group of negatives being printed.

These values of transition points, however, are dependent upon the general level of print contrast, which is represented by equation (1). It must be recognized that this equation is derived from the objective characteristics of those positives which, in the average opinion of our group of judges, were identified as of optimal photographic quality. Our group of judges included persons of diverse experience in the photographic field; some are classified as inexperienced amateurs, others who had had many years of experience in judging photographic quality are characterized as "experts." Between these two extremes of experience are some who had had limited experience. I am convinced that a similar-sized group of different observers, completely unprejudiced by any knowledge of the techniques involved in the making of the prints, would arrive at approximately the same average opinion concerning the positives with respect to first-, second-, and third-choice classifications. This conclusion assumes, of course, that the process of judging the photographic quality is carried out under the standardized conditions mentioned in the previous paragraphs and that the judges are uninfluenced by *preconceived ideas* of the quality of photographic prints most acceptable to specific groups of consumers of photographic materials. It has often been stated that the "amateur" prefers a "harder" (more contrasty) print than that which is preferred by the experienced or professional worker in the field of photography. On several occasions, the first in 1926,⁶ it has been proved to our own satisfaction that this assumption is invalid, and that if the inexperienced amateur is given an opportunity to choose the print of photographic quality which he prefers, it will, on the average, be very close indeed to the average photographic quality chosen by a group of experienced observers.

In addition to the information concerning the relationship between DS_n and log SES_n required to give positives of high photographic quality, this psychophysical investigation yielded other results of considerable importance.



20. Graphic method for establishing transition point indices which are unique functions for each grade of printing paper.



21. Scene having a luminance scale of 52, the tone reproduction curves of which are shown in Fig. 22.

Thus, from the judgment data on the printing exposures yielding the print of optimal quality, it is concluded that the scene element of minimum brightness, B_{\min} , corresponding to the extreme shadow region of the scene, is the best criterion of the printing exposure yielding the positive of optimal quality. D_{\min} is a unique and measurable characteristic of the negative.

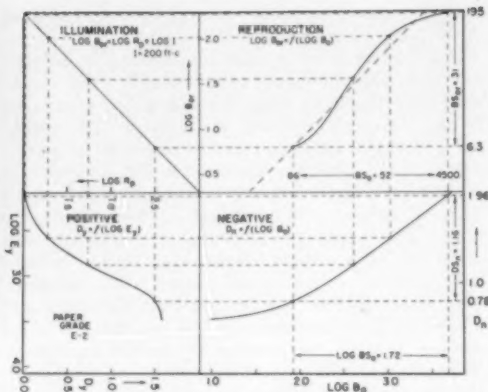
From the average of the judgment data concerning the grade number yielding the first-choice prints of these negatives, it is concluded that, on the average, the used portion of the D-logE characteristic extends from a point on the toe of the curve where the gradient is $0.1\bar{G}$ to the tangent point on the shoulder where the gradient is equal to \bar{G} . On this basis we have recommended that the *sensitometric exposure scale*, SES_p , of printing papers be defined in these terms. The density corresponding to the tangent point, B (Fig. 5), on the shoulder is somewhat less than the *maximum available* density of a positive material. But, on the average, this maximum available density is not used. It may be used in some cases, but in other cases the maximum used density is well below that of the tangent point. This is particularly noticeable in the case of paper grades having low values of sensitometric exposure scale.

A general and qualitative conclusion that can be drawn from the results concerning the relation between DS_n and $\log SES_p$ is that, on the average, negatives having high values of density scale are printed on positive materials having a log sensitometric exposure scale value somewhat less than the DS_n of the negative. On the other hand, negatives having very low values of DS_n tend to be printed on positive materials having values of $\log SES_p$ somewhat greater than DS_n . This conclusion, of course, follows directly from the analytical relation

$$DS_n = 1.35 \log SES_p - 0.40. \quad (1)$$

7. TONE REPRODUCTION IN THE FIRST-CHOICE PRINTS

Let us now consider briefly the objective tone reproduction obtained in a few of the first-choice prints. All the data necessary for the computation of an objective tone reproduction curve are available. The scene in Fig. 21 has a luminance scale of 52. In Fig. 22 the graphical solution for a first-choice print made on paper grade 2 is shown. The curve in the lower right-hand quadrant shows the relations between the density of the negative,



22. Graphic illustration of the construction of the objective tone reproduction curve for the scene shown in Fig. 21.

DS_n , and the logarithm of the object brightness, $\log B_0$. It should be emphasized that this is *not* the characteristic curve of the negative material. The data required for plotting the curve of the negative include the maximum and minimum brightness of the scene, the maximum and minimum density of the negative, and the sensitometric characteristic curve of the negative material. The derivation of the negative function has been discussed in detail in a previous publication.¹ The presence of flare light in the camera when the negative was made accounts for the difference between the shapes of the characteristic curve of the negative material and that of the negative. The magnitude of flare light depends upon many factors, including the physical and optical characteristics of the camera-lens combination, the distribution of luminance within the scene itself, and that within the scene environment.

The sensitometric characteristic of the paper grade 2 is shown in the lower left-hand quadrant, and in the upper right-hand quadrant is the objective tone reproduction curve. This has a maximum gradient in the region of the middle tones considerably in excess of unity, indicating some expansion of the luminance differences in this part of the tonal scale of the original. In the highlight region, the gradient declines to a value approaching zero, indicating a considerable compression of the luminance differences in the highlight region. In the shadow region, gradients also are lower than unity, but even in the extreme shadow the gradient is still appreciably above zero. Thus, while there is compression in the shadow region in this case, the compression is not as great as that in the highlight region.

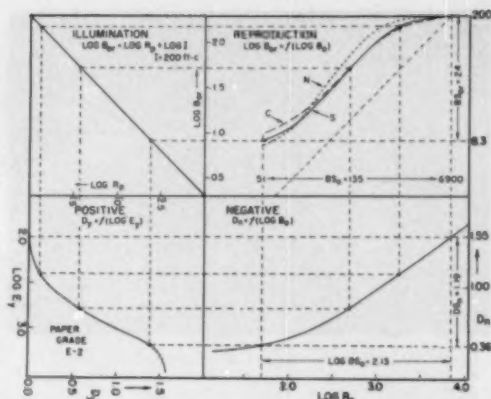
In Fig. 23, which represents a similar construction, applying to scene No. 170 (Fig. 8), which has a luminance scale of 135, the objective tone reproduction curves for the first-, second-, and third-choice prints from this negative are shown. They are designated as C, S, and N, but these letters have no significance as to which is the first-, second-, or third-choice. No purely physical method of computation is known to me that will show with *certainly* in all cases which of three positives, similar to those illustrated in this particular case (Fig. 23), will exhibit optimal photographic quality as determined by

the average judgment of a large group of observers. Methods for computing the relative photographic quality (and this term is used in reference to the appearance of positives) have been proposed. Many years ago, when I knew much less about the subject than I do now, I proposed such a method,³ based on evidence derived from the study of a single scene and of the objective tone reproduction curve which was known to give a positive of the highest relative quality. This method has not been proved to be of general validity.

Consider again Fig. 23. The judges who examined the three positives represented by the three objective tone reproduction curves agreed that the one marked S had the best relative photographic quality, while that marked C was their second choice, and the one marked N the third. The old saying that "hindsight is better than foresight" applies here. One may be tempted to say it is obvious that the curve S represents a print of better photographic quality than either of the other two. But, again, it should be emphasized that thus far no reliable method of general validity for arriving at this conclusion in the absence of the psychophysical judgment data has been found.

It should be emphasized that while these three curves were determined by straightforward and purely objective methods, there is nothing in this method that indicates unequivocally which curves represent the best photographic quality. That information was obtained by a purely subjective or introspective process. These curves, therefore, have a content of meaning extending far beyond their purely objective aspects. They have been placed in the order of relative quality by purely subjective introspective methods, and hence it is reasonable to regard them as subjectively determined. They may, therefore, be properly classified as belonging to the category of psychophysical relationships. Their shapes are determined objectively but they are placed in their relative order of excellence by subjective observations.

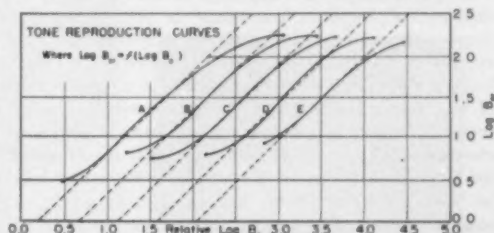
Figure 24 shows a group of objective tone reproduction curves for five first-choice prints, one made on each of five different grades, 00, 0, 1, 2, and 3, reading from left to right, of positive materials. Reading in the same sequential order, the log BS_0 values are 2.61, 2.22, 2.17, 1.95, and 1.62, while the corresponding values of DS_0 are 1.87, 1.46, 1.23, 1.05, and 0.70. These are typical of the 126 objective tone reproduction curves applying to the first-choice prints. In these cases the slope of the central portion of the tonal scale has a slope very close to unity, with considerable compression in both the highlight and the shadow regions. Here again, on the average, the degree of compression in the extreme shadows is somewhat less than in the extreme highlights. About 85 percent of all of the first-choice prints have objective tone reproduction curves similar to the type shown in this figure. In the remaining 15 percent, there are wide departures from the type, some in which the gradient through the halftone region is appreciably greater than unity and others less than unity. One characteristic that persists fairly well throughout the whole group is that the extent to which the luminance differences are compressed is somewhat less in the shadow region than in the extreme highlights. This is certainly true if the average results derived from the whole group are considered.



23. The objective tone reproduction curves designated as S, C, and N in the upper right-hand quadrant apply to the first-, second-, and third-choice prints of scene No. 170 ($BS_0 = 160$).

While it may be interesting to speculate on the mental processes involved in the final judgment of relative photographic quality, the outcome of this speculation affects in no way the usefulness of the psychophysical relations which have been established, since they do give definite and unequivocal answers to questions which at present cannot be answered by the consideration of physical factors alone. It is not possible to obtain, from any *a priori* applications of objective tone reproduction theory, solutions to the problems of photographic quality which are, in all cases, valid and not subject to possible contradiction by direct experiential evidence.

In a previous section of this discussion a statement was made to the effect that our knowledge of the subjective responses to objective stimuli is not sufficiently comprehensive to make it possible to predict with certainty, under all conditions, the objective characteristics of a positive which will reproduce the subjective impression that the observer experienced when viewing the original scene. I do not wish to leave you with the impression that the subjective aspect of the tone reproduction problem cannot, in some cases, be solved quite satisfactorily by using our knowledge of the way in which the human visual mechanism responds to objective stimuli. If the conditions in the entire visual field, when viewing the object and the photographic reproduction, are sufficiently simple, it is possible to predict, with quite satisfactory precision, the objective quality of the positive which will reproduce the desired subjective impression.



24. Objective tone reproduction curves for a first-choice print made on each of the five grades of paper used.



25. Black cat in a coal bunker at midnight.

This can be demonstrated for one case in which, I believe, you will agree, a satisfactory result can be obtained. The realization of this objective is simplified to a considerable extent by the conditions which exist in this room. At the present moment, with the room lights on, your eyes are adapted to a relatively high illumination level. However, by extinguishing all of the room lights, the "adaptation" process will set in immediately and will proceed at a relatively rapid rate for the first two or three minutes and then more slowly as adaptation to an extremely low level of illumination is approached. It is possible to predict, with fair precision, the luminance and contrast sensitivity of the eyes at a relatively short time after extinguishing the room illumination. On the basis of this knowledge, it is possible to prepare a lantern slide having certain objective characteristics with respect to transmittance which, when projected with the particular lantern being used this evening, will form on the projection screen an image of known luminance and luminance differences. If the computations have been correct, you should obtain a fairly close reproduction of the subjective impressions which would have been aroused if you were in a position to observe the object photographed and represented in this lantern slide. The subject which has been chosen for this purpose is a black cat with white whiskers in a coal bunker at midnight. I do not wish to imply that there was in this empty coal bunker a complete absence of light. Perhaps a few stray moonbeams had filtered in through a knot hole so as to give an extremely low level of illumination. Immediately after the extinguishing of the room light you will probably not be able to see anything whatever on the projection screen, but, after your adaptation to the low levels of illumination progresses, you should be able to just distinguish the presence of this black cat having the same appearance as that which you would have experienced had you viewed the original. Figure 25 is a reproduction of the lantern slide used in this demonstration but, of course, as seen on the printed page and under illumination conditions differing widely from those that existed when the positive was projected, the subjective impression may be vastly different from that experienced when an observer viewed the original in the surroundings as specified.

While in this discussion I have not attempted to give

specific and quantitative rules for the making of positives of maximum photographic quality from every possible negative, I do hope that what I have said may have given you some understanding of the broad general principles and of the useful results that may be obtained by the application of psychophysical methods in the evaluation of photographic quality.

Acknowledgment

I wish to acknowledge my very great indebtedness to many individuals who have assisted in the investigations that have been discussed in this lecture. A complete list of their names would closely resemble a complete roster of the sensitometric section of the Physics Department of this Laboratory. The amount of experimental work involved in the problems discussed was of great magnitude and could only have been carried through with precision and thoroughness by a group working as a harmonious team. I therefore gratefully acknowledge my indebtedness to all of the individuals who have contributed to the collection of the original data and to its reduction to its present form. I feel that I must mention especially at least two individuals who have contributed most largely to this work.

The major portion of the field work of making the photographs of the large number of exterior scenes that have been studied was done by Mr. H. R. Condit. He also was responsible for the reduction of many of these data and for the densitometric measurements made on the negatives. He has collaborated with me fully in the preparation of the scientific communications to which reference has been made.

Mr. C. N. Nelson has carried the burden of planning and supervising the making of many thousands of prints from the collection of negatives made by Mr. Condit. This, you will realize, involved an enormous amount of work, and he has shown initiative and imagination in planning the work and in interpreting many of the results. He also has collaborated fully with me in the preparation of some of the communications to which reference has been made.

At this time, therefore, I want to acknowledge my great indebtedness in particular to Mr. Condit and to Mr. Nelson, as well as to the large number of other members of the staff who have cheerfully and efficiently assisted in the conduct of this work.

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FIRST REPORTS ON DRIVE OF CHAMPIONS

Although all the necessary bookkeeping has not been completed as this issue goes to press, it appears that the big prize winners are as follows. More detailed information will be published in next month's JOURNAL.

Grand Champion

Boris Dobro, Santa Barbara, Calif. Cornerstone Membership.

District Champions

No. 1. Paul Sperry, New Haven, Conn. Life Membership.

No. 2. Franke Fassbender, New York City. Life Membership.

No. 3. Foster Moyer, Reading, Penn. Life Membership.

No. 4. Doris M. Weber, Cleveland, Ohio. Life Membership.

No. 5. Herbert Jackson, Signal Mt., Tenn. Life Membership.

No. 6. Frank Heller, Bartlesville, Okla. Life Membership.

No. 7. Walter Parker, Chicago, Ill. Life Membership.

No. 8. C. W. Getzenauer, Forest Grove, Oregon. Life Membership.

No. 9. Boris Dobro, Santa Barbara, Calif. Cornerstone Membership.

No. 10. H. A. Touhy, Hawaii. Life Membership.

Area 1. Canada—Sam Vogan, Toronto, Canada. Life Membership.

Area 2. Central & South America—Angel DeMoya, Cuba. Life Membership.

Area 3. British Isles & Europe—No member qualified by assembling more than five points. None.

Area 4. Australia, Asia and Pacific Islands—Francis Wu, Hong Kong. Life Membership.



PSA Officials at the Detroit Convention discussing plans for the use of PSA memberships as Christmas gifts. Left to right: Randolph Wright, Jr., Headquarters Manager; Mrs. Constance L. Phelps, Hon. PSA, Secretary; Charles Heller, Hon. PSA, Treasurer; and John H. Magee, APSA, Chairman of the Finance Committee. Special gift certificates have been prepared by Headquarters which may be obtained at \$10 each and which announce that a membership in PSA has been given to the recipient. Let PSA solve your Christmas shopping problems for fellow photographers this year; merely send their names and addresses to Headquarters. Photo by Fred Quellmaiz.

Membership Suggestion

These prints won for their makers a membership in PSA for one year, all as prizes contributed to his classes by Adolf Fassbender, Hon. FPSA. Each year Mr. Fassbender gave 15 such prizes for prints receiving the highest number of votes. Previously, he gave merchandise prizes but he finds PSA memberships much more popular with the winners.

Why not give PSA memberships for prizes in your club or school? There's no better value. Headquarters has gift membership cards.

An Apology

Our sincere apologies to Karl A. Baumgaertel, APSA, for running his excellent panel, "The Phantom Ship," up-side-down in the November PSA JOURNAL, page 681. In spite of detailed instructions on Karl's part, and a caption that does not make sense unless the plate is run correctly, the halftone was inverted. We are sorry.

Ralph E. Gray Honored

After 6 lectures and screenings of his prize-winning movies in 3 days, PSA's roving good will ambassador, Ralph E. Gray, FPSA, was made an Honorary Member of the Berks CC of Reading, Pa., one of the few to have ever been so honored. His slides and movies were enthusiastically received by several thousand school children, as well as by over a thousand adults.



CONTEMPLATIVE Patricia Stafford



SUNNY WINTER

Eleanor Rost



ANNO DOMINI 1651 Dr. Otto Knauerhase

Exhibition Listing

This is the final unofficial exhibition listing for the year which began July 1, 1950 and ended June 30, 1951. One hundred and four open exhibitions were held which allowed a maximum of 4 prints per entrant and which hung 125 or more prints. They were:

Antwerp, Belgium	Manitoba, Canada
Arlona	Memphis, Tennessee
Argentina	Midland, England
Ashville, N. C.	Mendoza, Argentina
Auburn, New York	Milwaukee, Wisconsin
Baltimore, Maryland	Minneapolis, Minnesota
Bangalore, India	Montreal, Canada
Barcelona, Spain	New Zealand
Birmingham, England	Norton-on-Tees, England
Barnes, England	Oklaheima City, Okla.
Bath, England	Paris, France
Burkehead, England	Pasadena, California
Bordeaux, France	Pittsburgh, Pa.
Boston, Massachusetts	Port Talbot, England
Brussels, Belgium	Philadelphia, Pa.
Calgary, Canada	Port Colborne, Canada
Cape of Good Hope, Africa	Portland, Maine
Canberra, Australia	Portugal
Charter, England	PPA, New York
Charleroi, Belgium	P.S.A.
Chicago, Illinois	Puyallup, Washington
Columbus, Ohio	Reading, Pennsylvania
Conshohocken, Pa.	Rochester, New York
Circle of Confusion, Calif.	Royal
Chile	Runcorn, England
Cincinnati, Ohio	Sacramento, California
Edmonton, Canada	Salzburg, Austria
Crippleplate, England	San Diego, California
Cuba	Seattle, Washington
Denmark	San Sebastian, Spain
Derby, England	San Sebastian (Vasco)
Des Moines, Iowa	Sao Paulo, Brazil
Detroit, Michigan	Solihull, England
Dumfries, Scotland	Southampton, England
Dixie, Georgia	South Africa
Edinburgh, Scotland	Shropshire, England
Edmonton, Canada	South Shields, England
Evansville, Indiana	Springfield, Illinois
Falmouth, England	Springfield, Mass.
Focus, Netherlands	St. Louis, Missouri
Ghent, Belgium	St. Louis, (Miss V.)
Great Falls, Montana	Toronto, Canada
Handsworth, England	Victoria, Australia
Harpden, England	Victoria, Canada
Hartford, Connecticut	Vancouver, Canada
Hong Kong	Western Ontario
Ipswich, England	Canada
Irish	Windslem, England
Japan	Witwaterstrand, So. Africa
Lincoln, England	Wilmington, Delaware
Louisville, Kentucky	Worcestershire, England
Lucknow, India	Zaragoza, Spain
Luxembourg	
Madrid, Spain	

The following exhibitors had 40 or more prints accepted in the above list:

Name	Country	Exhib.	Prints
Frank J. Heller	USA	96	262
Harry L. Waddle	Canada	88	251
Doris Martha Weber	USA	83	223
Jack Wright	USA	78	207
Eugenia Buxton	USA	75	180
H. R. Thornton	England	66	177
Theodore L. Brunson	USA	69	168
G. L. Weisenburger	USA	65	162
Alfred Watson	USA	73	145
Lowell Miller	USA	48	138
J. W. Galloway	Canada	67	135
Dr. Juris Benjamin	England	45	129
Jose Ottilia, Filho	Brazil	56	121
H. W. Wagner	USA	50	119
Carl Mansfield	USA	46	113
Allan L. Horvath	USA	38	112
Boris Dolan	USA	37	111
O. E. Romig	USA	43	107
H. Roy Hudson	England	42	105
Francis C. K. Wu	Hong Kong	42	105
Irina G. Hasselwood	USA	46	103
C. J. J. Schaapman	Netherlands	38	103
Charles L. Wilson	USA	38	101
Merrill W. Tilden	USA	37	101
Dr. Max Thorek	USA	49	91
Jose Orle Echague	Spain	29	90
Eleanor Parke Curtis	USA	35	90



PSA CHRISTMAS GIFTS. Personalized neckties make an excellent gift for photographers and friends. Hand-painted ties of rayon or nylon in maroon, bright red, navy, medium blue, dark green, brown and gray are available at \$5.00 each, post-paid, from PSA Headquarters. Indicate copy and lettering desired and include rough sketch. Allow at least two weeks for delivery after receipt of order in Philadelphia. And for another gift suggestion, don't forget PSA memberships.

Grace M. Ballentine	USA	58	87	Ralph L. Mahon	USA	26	52
A. Aubrey Bodine	USA	25	86	Dr. William F. Small	USA	28	51
Silva Nogueira	Portugal	37	84	C. N. Chambers	India	28	50
Earle W. Brown	USA	32	79	Ann Marie Grieman	Sweden	20	49
James A. McVie	Canada	36	79	Dr. E. Throp Geer	USA	21	49
Ludwig Schuster	Germany	53	79	Tibor de Coorgo	Hungary	23	49
Wellington Lee	USA	27	77	Fred C. Kahom	USA	23	49
Errol A. Nym	India	36	76	George Seim	USA	23	49
J. P. Carney	Australia	40	74	Charles W. Fairbanks	USA	20	48
Dr. John S. Anderson	USA	34	73	D. Ward Pease	USA	25	48
Kene Jentgen	Luxembourg	34	73	Robert V. George	USA	20	47
Dr. G. Thomas	India	43	73	Rudolph Sulke	Austria	25	47
Lawrence M. Spaven	USA	27	72	Martin J. Winnik	USA	25	47
Leo S. Lerch	USA	19	69	M. Van de Weyer	Belgium	26	47
John I. Fish	USA	33	69	Dr. D. J. Richards	USA	21	46
James F. Thompson	India	37	68	Frank E. Fuller	USA	24	46
Kanti A. Patel	USA	36	68	Trond Hedstrom	Finland	24	46
Dr. Robt. F. Edgerton	USA	33	67	F. Elliot Westlake	USA	24	46
Francisco Aszman	Brazil	18	66	Walter W. McKee	USA	28	46
Karl Pollak	England	20	66	E. F. Schafer	USA	14	45
Barnard M. Acosta	USA	33	66	Wing Cheung Wong	China	24	45
Charles W. Maner	USA	33	66	Dr. Carrol C. Turner	USA	26	45
M. M. Deaderick	USA	23	64	Frank Meister	USA	18	44
Florence Jordy	USA	29	64	John F. Barnes	USA	20	44
Victor Skitka	Hungary	29	63	Yet Pore Pun	China	24	44
Francesco Giovanni	Italy	30	63	Yung Kwong Wong	China	25	44
William E. Bush	USA	31	63	Fred Bauer, Jr.	USA	16	43
Antonio Rosa Casaco	Portugal	31	63	K. Pazovski	England	25	43
Betty H. Huelt	USA	33	63	Frank A. Loftinger	USA	18	42
Erno Vadus	Hungary	27	62	Carlson F. Luce, Jr.	USA	19	42
Rex Frost	Canada	26	62	Zoltan Berekméri	Hungary	21	42
Howard E. Foote	USA	25	61	Leon Craig Fergie	USA	22	42
Clarence C. Ruchhoff	USA	34	61	N. V. Mehta	India	24	42
Boyd W. Hindman	USA	41	61	Dr. Francis A. Faught	USA	29	42
George J. Hughes	Scotland	28	60	Harvey H. Oehl	USA	29	42
Joseph Seidl	Hungary	36	59	Harvey W. Brown	USA	18	41
Tsae-Kong Sit	China	26	58	Antonio S. d'Almeida	Portugal	24	41
Wilber H. Wier	USA	24	57	R. A. Panter	Canada	17	40
Louis A. Fuggard	USA	23	56	Jan Beran	Czechoslovakia	19	40
Avri Bakonen	USA	24	55	Sam K. Chow	USA	20	40
Gerald Tattersfield	USA	26	55	Harold M. Biggs	USA	21	40
Cyrus A. Yarrington	USA	31	55	A. C. Gray	Australia	21	40
Barton King	USA	28	54	Clarence T. Aral	USA	23	40
Joe E. Kennedy	USA	21	52	Mario Pinto	Portugal	23	40

PSA MOTION PICTURE DIVISION

A. MILLARD ARMSTRONG

"Detroit for Fun in '51" was not only an apt slogan—it was a promise that was actually fulfilled. Practically everyone of the more than 1100 persons attending the Convention had a lot of fun—while renewing old acquaintances and making new ones. Photographic ideas were everywhere. Almost everyone highly complimented the Detroit Convention Committee for their hard work and careful planning. Angus Diack, serving as the Detroit MPD representative, deserves high praise for his efforts that helped make our meetings so successful.

Wednesday night the MPD screened three outstanding films which had been accepted for exhibition. Dr. Harold Lincoln Thompson, Los Angeles, California, submitted one especially outstanding film—1600 feet in color and sound on Hawaii. The film completely covered the Islands and was notable from a photographic and human interest standpoint. If a vote had been taken after this film was shown, the audience would undoubtedly have selected Hawaii for the next PSA Convention.

Avalon Daggett, Los Angeles, California, sent a color and sound film on the Smoki Snake Dance. The business men of Prescott, Arizona, have an association for the purpose of preserving Indian lore of the Southwest. Daggett's film showed the businessmen making preparations for the Dance, as well as the Dance itself. Although the snakes looked repulsive and vicious to the average movie maker, they were all harmless species.

"How to Become an Amateur Cinematographer" by Charles Peters, Beverly Hills, California, brought forth many a laugh. This film portrayed the trials and tribulations of the amateur cinematographer who starts out to buy a simple movie camera (no gadgets) but ends up with so many accessories that they fill the family auto and the only place for friend wife is on the running board.

Thursday morning an outstanding program featured "The Emperor's Nightin-

gale." This Agfacolor film, made in Czechoslovakia in the period between the Nazi and Russian occupation, was brought to the United States by William Snyder who re-edited the film and put on a new sound track. The principal story of the film was told with animated doll figures. The animation of the dolls was close to perfect. Nine men worked for three years to make the original film. The care that was taken in doing so was quite apparent in the final result. "The Emperor's Nightingale" is a fantasy which should be appeal-

cluding the one that wiggled his ears, were very good. Some of the audience wondered how the Hurds were able to bring down the game with only one shot. We did not ask the Hurds whether they were remarkable marksmen or whether it was just good editing of the film!

More than sixty people enjoyed the MPD Annual Banquet. The food was delicious—the fellowship delightful. Among the fellows who graced the occasion were all the big wheels of the MPD, the writing and publishing gentry such as Frank Fenner, Jacob Deschin, Fred Quellmalz, Norman Lipton, and George Rowan—the technical giants, Glenn Matthews, John McFarlane, Ira Current, Paul Arnold, and Dr. Frank Back (inventor of the Zoomar lens). Probably even more important than the fellows, and definitely adding more to the attractiveness of the occasion, were



MP Division officials at Detroit. Harris B. Tuttle, Chairman Vincent H. Hunter and Secretary - Treasurer Alfred S. Norbury lay plans for 1952. Photo by Fred Quellmalz.

ing to both the eight year old child and the eighty year old grandfather—and all ages in between. The story of the film was introduced by photography of live people. If there was any adverse criticism of the film, it would be that the live actors were not as good as the animation and that the introduction was a little too long. Other than this, everyone found it a remarkable job.

Thursday night the feature film presented before the entire Convention as the MPD program was that of a big game hunt in Africa photographed by PSAer Edwin J. Hurd, Detroit, Michigan, and his father. There were many excellent views of wild animals, birds and the African back country. The close-ups of the elephants, in-

the ladies—none of whom have aged a bit since last year. We are almost afraid to name any of them because space won't permit naming them all, but present in all their feminine glory were Priscilla Hunter, Beulah Fenner, Frances Armstrong, Eleanor Fulmer, Helen Jones, Sandra Thaw, Helen Schoedinger, Jayne Quellmalz, Leona Rupp, Mrs. Warner Seely, Marguerite Kyle, and Mary Doe (the latter in case we have omitted any important ones.) In his usual place among the ladies was that world famous amateur—Ralph Gray.

At the banquet, Harris B. Tuttle, FPSA, was presented with a certificate of recognition of his valuable services in contributing articles to the MPD Section of the PSA JOURNAL and as Acting Editor.



At the MP Annual Banquet: (Left) Clockwise—Mrs. Frances Armstrong, Fred B. Rupp, Jr., Mrs. Beulah Fenner, Frank Fenner (hidden) and Edwin J. Hurd. (Right) Larry Sherwood, Vincent Hunter and Herbert MacDonough. Photos by A. Millard Armstrong.

PSA NATURE DIVISION

HARRY R. REICH, APSA

286 Schenck Street, No. Tonawanda, N. Y.

Convention Notes

Another PSA Convention has come and gone and we must admit that whoever was responsible for the slogan, "Detroit For Fun In '51," was a prophet of the first order. Fun was the one item on the agenda which was apparently of prime importance to the entire Convention Committee, and their efforts were reflected in the general complexion of the Convention.

The "South of the Border" barbecue, the Greenfield Village field trip, the Cranbrook Institute pilgrimage, the old-fashioned studio, the lovely models who toured the halls in costume announcing programs, the clowns that delighted the loungers in the halls with their antics, the highly illuminated mirror conveniently placed so that the convention guests could do a little primping and which later proved to be a one-way mirror concealing an eager-beaver PJ Division photographer who snapped all of his patrons in some most interesting action, these and many other features combined to produce more fun in '51 than it has ever been our privilege to experience at any convention before.

The Nature section of the Exhibition was outstanding both in monochrome and color. The show as hung and as projected reflected a standard of quality indicative of the excellent qualifications of the jury of selections. We wish to express our appre-

ciation to the jury, Henry M. Mayer, Walter P. Nickell, and Roger E. Richard, for a job well done.

The Nature features of the Convention program left nothing to be desired. They were well attended by a very appreciative audience. The program of W. H. Savary on "Long Focal Length Lens Problems and Bird Photography," the Color Clinic, and the talk on color composition by Fred Bond were of the "how to do it kind," and were very helpful to the nature

photographer. Louis Quitt's program on "Insect Photography," which featured the metamorphosis of various species, was very informative and his slides reflected the superior ability of the maker. H. Lou Gibson did an excellent job in representing the Nature Division on the Johnny Appleseed program and came up with all the right answers to the questions directed at him. Robert C. Hermes' program, the showing of his 16mm color movie, "Exploring Canadian Bird Islands," proved to be one of the feature attractions of the Convention. It evoked probably more "ohs" and "ahs" than any other program. If he were able to accept all the invitations that have been and will be forthcoming, he would be busier than the proverbial one-armed paperhanger.

The greatest thrill of the Convention so far as the writer is concerned was the Nature Division luncheon. There were more than 100 present and we were honored by the attendance of John Mulder, the outgoing President of the Society and Norris Harkness the incoming President and his charming wife. Surely, such an attendance at the luncheon of the youngest division of the Society would thrill the heart of the Chairman beyond bounds. To me it reflects a tremendously stimulated interest in nature photography and the ND, and serves as an inspiration to greater effort towards the success of the Division.



Those at the head table at the Nature Division luncheon at Detroit included Mrs. Harold L. Medbery, Harry R. Reich and Alice Stark. Photo by Fred Quellmalz.

The luncheon was held in the Old Wayne Club about half a block from the Book-Cadillac Hotel. There were the usual speeches which were brief and to the point. Mr. Mulder, Mr. Harkness, H. J. Johnson, Paul Wolf, Sam Vogan, Fred Quellmalz, and Mrs. Alice P. Stark each spoke a few words on selected subjects. Fall flowers, fall leaves to which were affixed frightening denizens of field and stream, and little figures riding on various members of nature's family formed the table decorations. There

were door prizes of photographic equipment and some humorous items which fell to lucky members who were fortunate enough to have their names drawn from a bag.

The success of the luncheon was attributable to the efforts of Mr. and Mrs. Harold L. Medbery and Mr. and Mrs. Len Thurston, who went all out to put on a wonderful show.

The climax of the Convention was the Honors Banquet on Saturday night in the grand ballroom of the hotel, at which time honors were bestowed upon those elected to receive them, among whom were twelve members of the Nature Division.

An Apology

Since the Convention post dated the publishing of "Who's Who In Nature Photography" by two months, we went to Detroit feeling that the Who's Who listing was 100 per cent correct because we had not received a single complaint of an error. Angel de Moya, however, deflated our ego when he informed Ruth Sage that he had had acceptances in two nature exhibitions and was not listed. A check of the Nature Division records against salon catalogues revealed that Mr. de Moya was correct, but due to the fact that one of the exhibitions listed him under "D" and the other under "M," our records had him listed twice but with only one acceptance in each case. Our listing should have shown under "M":

Exhibitions	Slides	Prints
La Habana, Cuba	2	2

Our sincere apologies to Mr. de Moya.

Nature Color Slide Contest

Fifty contestants submitted a total of 195 slides to this contest. The judging was held on September 18th. The judges were: Conrad Emanuelson, FRPS, of Green Briar Camera Club, Pearl E. Schwartz, of Chicago Nature, Chicago Color and Green Briar Camera Clubs, and Floyd A. Swink, of the College of Pharmacy, University of Illinois. The awards were as follows:

Medal Awards

Edward A. Hill, Fleetwood, Pa. "Indigo."
Charles J. Norona, Los Angeles, Cal. "Sea and Gulls."
Al Suter, Chicago, Ill. "Barn Swallow."

Honorable Mentions

Dr. M. A. Chantler, New Toronto, Canada. "Golden Texture."
W. T. Davidson, Warren, Pa. "Evening."
Robert W. L. Potts, San Francisco, Cal. "Strange Fancy."
W. H. Savary, Plainfield, N. J. "Male Blue Bird."
A. Stewart, Santa Barbara, Cal. "Pyrotechnics."
Rev. Joseph R. Swain, Middletown, Conn. "Herring Gull."
Ruth Tremor, Buffalo 7, N. Y. "Promethea Moth."

The September Nature Color Slide Contest was conducted in Chicago, Ill. under the chairmanship of Willard H. Farr, APSA.



Thoughts at the Close of the Year

The end of another year is fast approaching, and I wonder just what the past 365 days have brought me.

I think I am a better photographer now than I was a year ago for I have learned a few more facts about the mechanical side of photography, which, if properly applied, should make my pictures better technically.

My study of art and design should improve my photography for now I understand better than I did one year ago how certain small variations in placement of the picture elements help to make it either good or bad in an artistic sense. And I have learned certain helpful principles about emphasis as a factor in design.

But most of all the end of another year has made me a better photographer be-

cause I have lived that year. I have changed during the past year. I have had several failures and disappointments—but I have had other successes and moments overflowing with happiness.

For only by living, feeling, seeing in every sense can any of us become better photographers. Each picture we take is a mirror of ourselves in some way, and only if the self, the soul, the center of our being, is full and rich can our pictures reflect that same fullness and richness.

True we can set up a picture on a cold-blooded analytical basis. We can place each of its elements exactly in its proper place. We can do a perfect technical job. The picture thus made would be perfect—except for one thing which determines,

always, whether or not that picture is worth while and will live. That is the soul of the picture which reflects the soul of the photographer.

For a picture with a soul can have mistakes in design and composition, it can be far from perfect mechanically, but the soul of the picture and the soul of the photographer will shine through—and that picture will live.

Do you want a goal to strive toward for the coming year? The goal which will do most to improve your pictures will be to improve yourself. Have you noticed that the photographers who make the pictures we all consider best are inspiring personalities in themselves?

You must live—feel—see. You must see both beauty and ugliness about you. You must feel deep sorrow as well as overflowing happiness. You must live—not just move about day after day in numbing routine.

The photographer with a soul cannot help but make pictures with a soul. And a photographer without a soul might as well give up and collect watermelon seeds.

With the end of another year, comes another chance to grow and improve. For the end of one year brings the beginning of another.

To all of you who read these words: May the year to come bring you just enough sorrow to keep your happiness from becoming too common.

Just enough failure to keep you aware of the sweetness of success.

Just enough learning to keep you aware of how much there is yet to be known.

Just enough friendship that you need never walk alone except by choice.

And may your soul grow in worth and stature until every man must say, "He is truly great."

STELLA JENKS

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PSA JOURNAL, Part 2, Dec. 1951

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COL. C. J. "JOE" PERRY, Associate Editor

HELP WANTED—Male or Female

WANTED—An American PSAer, male or female. One who is qualified to produce salon type prints, who will permit me to view his or her prints in my home, and who in turn will view my prints in his own home and give me the benefit of his knowledge and experience in order that I may

improve my humble photographic efforts. For this invaluable service I can offer no monetary compensation but can and do extend my undying gratitude and prayers of thanks. Please respond through PSA Director of International Portfolios.

That's the way they would say it State-side, and that's the way they mean it all around the globe. However, the American Want Ad is not in common use in many off-the-road villages in remote corners of the earth.

This is the way they actually do write their plea:

A 21 year old lad, holding a subordinate position in a government agency, in a far-away place with a strange sounding name says it like this:

The learning of photography is the motivating aim of my life. I have received honors and certificates at salons in my own country and abroad but there is much yet to be learned. Unfortunately I do not own a camera of my own but I have good friends who permit me to borrow their camera. I develop my film in dishes set on ice because the temperature is high in my country. My home does not have electricity so I must be patient until the sun departs and develop my precious films in a dark corner of my home. I make enlargements with the equipment of our camera club. My heart is full with the desire to improve my proficiency in my beloved hobby. I will be eternally grateful for any help you may spare to me.

A business man in a Latin American country puts it this way:

Today I am overjoyed! My man brought to me the wonderful portfolio of our American friends and I immediately left from my office that I would lose not one precious minute in enjoying the many helps and assistances of my beneficent American friends in photography. I am much akin to the small child who arises before the sun on the Day of the Nativity to examine the gifts the Christ Child has blessed him with—I think you say in your language "Christmas presents." I am indeed greatly overjoyed today.

An advocate in a European country says it this way:

Ten million gratuities for the opportunity to inspect the outstanding work of our American friends. The gratuities for the immeasurable degree of assistance they have given us can be numbered only in blessings and it is with certainty that the multiple rewards of eternity shall be assured to them with bounty.

This is the reaction we got from an American PSAer:

Brother did those Japs clip my wings! I thought I was kinda hot but when they got through with me I was headed for the showers! I'm in this thing for keeps from now on, the fresh viewpoints I get from our overseas friends is something that you just can't buy with a catalog—those people turn out salon prints that would make you drool, and they do it without gadgets, too. The down to earth good photography those guys turn out is something to write home about. I'm gonna stay right in there punching (til the bell stops me—and confidentially, just watch my salon record start up from here on out.

How about that?

There is a need for PSAers capable of producing salon quality prints, and there is a place for you in the Internationals. You can just about name your spot on the globe and we can almost put you there.

These folks around the world need your help and they want your friendship.

Are you going to let them down?

A postcard will get you started. How about it?



MISS EVELYN ROBBINS, Associate Editor

How About a Feud?

In writing this column, I have two basic jobs. One is to interest more of the readers of the JOURNAL in the Pictorial Portfolios, and the other is to suggest ways and means of getting more enjoyment, and more practical benefit, from participation in the portfolios by those who are already members of one or more circles.

Because I am personally so very enthusiastic about the benefits to be derived from this activity, it is probably true that the majority of the articles I have written for this column have attempted to do a selling job—to interest you folks who are not at this time participating in the portfolio activity.

Right now, I would like to pass on to you active portfolioists an idea which popped up in one of the portfolios, and which I think could become a pepper-upper for any circle. Here's the story.

In a certain portfolio there are two persons who are personally acquainted, although they live several hundred miles apart. Both of them like to do table tops, or still lifes, and both have submitted several in this particular portfolio circle. At a meeting at the Convention, this idea was cooked up: Why not start with identical material, and then put both prints in the

same circuit, asking the other 13 members to decide which maker had done the best job. I can't report on the success of the idea, because the returns aren't in yet, but it seems to me there is a good idea here—not only for those who like still lifes, but for others, as well.

For example, if there is another fellow in your portfolio who likes to shoot dogs, send him, directly, a challenge and see who makes the best dog picture. If there is another fellow who has a young daughter, challenge him; let the other members of your circle decide who can produce the best picture of a little girl.

The possibilities are, of course, practically endless, and it seems to me that such a device might not only be a spur to the two directly involved, but the good natured feud might also be very interesting to the other members of the portfolio, and possibly inspire them to do likewise.

The World's Best Introduction

If you have ever attended a PSA Convention or a regional meeting, you know that there are two classes of people there: Those who seem to know everybody, and have a wonderful time, and those who stand more or less on the fringes, and don't have nearly as good a time as they should have, simply because they don't know anyone, and are, perhaps, too shy or diffident to make acquaintances readily.

People who belong to even one Pictorial Portfolio never belong in this second category. They know at least a few people at the Convention, because they have become acquainted with them through their portfolio activity—and if you know a few people at a PSA Convention, you belong in the inner circle, because each of these people that you know are likely to know a few others.

Of course, if you belong to several Pictorial Portfolios, you are in an even better position to completely, truly enjoy the convention, because you will have so many ready-made contacts.

If you don't belong to a Pictorial Portfolio now, by all means join one! If you belong to one, join two or three others. If you follow this suggestion, I will guarantee that when you come to the 1952 Convention in New York City you won't be a wallflower; you will meet friends there, and you will be in the very thick of everything that goes on.

Now is the time to take this action, so that you will have plenty of time to develop those precious portfolio friendships. You know, of course, that if you are a PD member the cost of joining a Pictorial Portfolio is only \$1.00 a year, and that complete information can be quickly had simply by writing E. R. Christliff, Hon. PSA, APSA, Director.

Comments By a Commentator

H. J. ENSENBERGER, APSA
Commentator, Portfolio #54

Experience as a portfolio commentator gives me added conviction that two requirements are vital for the budding photographer: A perception of the esthetic side

PSA International Portfolios

There are openings in the following PSA International Portfolios for Pictorial Division members who are interested in interchanging prints for comment and analysis with the leading photographers in foreign countries:

Anglo-American
Canadian-American
India-American
Australasian-American
Cuban-American
French-American
Swedish-American
South African-American
Brazilian-American
Belgian-American
Chinese-American
Netherlands-American
Dominican-American
International Medical Portfolios
Costa Rican-American
Caribbean-American
Mexican-American
International Control Process Portfolios

For information, write to the Director of PSA International Portfolios, Col. Charles J. Perry, 7431 Ryan Circle, El Paso, Texas.

and a knowledge of the technical angle. Both are important and opinions will vary as to which should come first. I have always felt that the average worker should begin by concentrating on the technical aspect. As it is, so many of them want to be an artist before they are equipped with enough ability to interpret their work to the best advantage by means of photography. The mechanics of photography are usually mastered by the average beginner through some study and practice, whereas the pictorial values require a more mature sense of appraisal, or perception. This perception comes somewhat slowly according to the individual. The portfolios open one way to help the worker conceive the idea by its variety of comments. Subtle criticism can be quite revealing. Thus, his errors are a blessing in disguise.

I cannot help but ponder over the magic of chemicals. In one instance, a little dab of stuff made from chemicals gives intensification. In another, we get reduction. Truly amazing—this; modern witchery.

Probably still more phenomenal is getting rid of common weeds in our lawns. We spray the lawn and the weeds vanish. Makes one think of selective dodging in photography. The chemical is applied to grass and weeds alike but only the weeds "take the rap."

Now as we dream we may consider it most desirable to add some of this "weed killer" to our developer and have our prints emerge devoid of the usual "weeds" or extraneous junk such as distracting backgrounds, etc. We may smile and say, "How wonderful!" But would it really be wonderful? If our prints could be turned out to perfection by such a magic concoction, there would be little left to hold our interest or to develop our creative ability. There would be no need for camera clubs, annual shows or dinners, portfolios, etc. Consequently, no treasured friendships that result from these activities.

It is through our blunders that we go forward. I am inclined to think that many (if not most) of the beginners in camera clubs and portfolios are somewhat sensitive to their mistakes. If, as a consequence, they would hesitate to submit their prints, they will almost certainly defeat the purpose of such an association. In other words, let us not allow our boners to get the best of us.

A portfolio offers quite a variety of comments and a conflict of opinions is not uncommon. Usually this creates a stumbling-block that is baffling to some of the members. Within a circle of 15, there is bound to be some difference of opinion. It is up to us to weigh these ideas one against the other and accept those that in our judgment will best improve our work.

I believe it helps a commentator to see a small print of the entire negative. While many members of Circle #54 include a small print along with their entry, others do not. Any advice on cropping or composition would be more helpful to a worker if the others in the circle as well as a commentator could see the complete print of the negative.

Circle #54 is a rather diversified family which not only includes beginners and advanced workers but salon exhibitors, one of whom is a commentator for another circle. So all of our members have the added benefit of some very talented advice. I consider each member a friend and have had personal calls and correspondence from a number of them. The only gripe I have is that the circuit is so timed that it invariably arrives at the wrong time: either before or after a vacation trip or during a real busy season. But, in spite of any drawbacks or criticism, I think the portfolio is one of the finest and most helpful of all PSA projects.

Star Dust *

ROY E. LINDAHL, General Secretary
PSA Star Exhibitor Portfolios

The detailed analysis that follows by P. H. Oelman, Hon. PSA, FPSA, is in response to the question raised by John's last entry to the Notebook in Star Number One.

"The question seems to be what effect camera size has on overall definition. The answer is that negative size *per se* has practically nothing to do with the problem. Assuming perfect optical systems throughout and eliminating other factors by choosing identical subject matter, printing paper, etc., the problem resolves itself into one of depth of field, or more specifically into depth of field at the hyperfocal distance since we are after definition throughout the picture area.

"In considering a problem like this I like to examine the objective first. Just what do we mean by definition? Suppose our end result is to be a 16 x 20 print. If the normal angle of view is included, correct perspective demands that the print be viewed at a distance of about 24 inches. At this distance research workers tell us that a circle of confusion of 1/100 inch in

* A monthly column devoted to the "Wit and Wisdom" of the Stars as taken from the Notebooks in the Star Exhibitor Portfolios.

diameter looks like a point so we can permit the circle of confusion of that diameter for good definition.

"With that as a starting point let's work back to the camera which makes the negative and for the sake of comparison we will take the two extremes—a 35mm job with a two inch lens and an 8 x 10 view camera with a twelve inch lens. If the 8 x 10 negative is enlarged two diameters to get the 16 x 20 print (using all the negative area) then the image made with the two inch lens must be enlarged 12 diameters to get the same size image (image size being proportional to focal length). The allowable circle of confusion in the image of the twelve inch lens is then 1/200 and that of the two inch lens is 1/1200.

"The hyperfocal distance is that distance on which a lens must be focused to have everything beyond that point to infinity in focus, that is, sharp within the limit of the permissible circle of confusion. Everything beyond half the hyperfocal distance will also be within the limit of sharpness. Thus, if the hyperfocal distance is 100 feet, everything from 50 feet, to infinity will be satisfactorily sharp.

"The optical formula for hyperfocal distance is:—

$$F \times F \text{ Where } F \text{ is the focal length in } \frac{1}{f} \times d \text{ inches, } f \text{ the numerical value of the stop and } d \text{ the diameter of the permissible circle of confusion. The result will be in inches.}$$

"Now let's take our two examples and see the result at 1/8.

$$\frac{2 \times 2}{8 \times 1/1200} \text{ equals } 50 \text{ ft. (Everything from 25 ft. to infinity will be in focus when the lens is focused at 50 ft.)}$$

$$\frac{12 \times 12}{8 \times 1/100} \text{ equals } 300 \text{ ft. (Everything from 150 ft. to infinity is in focus when focused on 300 ft.)}$$

"Note that the nearest point within permissible definition is directly proportional to the focal length of the lens. Thus under identical conditions a one inch lens would focus from 12½ feet to infinity and a four inch lens from 50 feet to infinity.

"Note also that the distance is inversely proportional to the f-value, thus at f/16 the distance becomes 12½ feet for the two inch and 75 feet for the twelve inch.

"One more notation. The actual definition of the image for the two inch lens will be much greater than that of the twelve inch but because of the difference of the size of the images the *useful* definition (for the purpose of printing at equal size) is the same in both examples.

"At the beginning I said that the size of the negative (distinguished from the size of the image) had practically no bearing on the problem. I had to give an out for in common practice the relative size of the negative determines the angle of view included. Thus it is quite possible that a wider angle (a larger negative in proportion to the focal length of the lens) may

AN INVITATION

This is an invitation to every PSA member to participate in the PSA American Portfolios.

Enrollments are now being received in the following specialized groups:

PSA Pictorial Portfolios
PSA Portrait Portfolios
PSA Miniature Portfolios
PSA Central Procom Portfolios
PSA Star Exhibitor Portfolios
(For PSA Award of Merit Winners)
PSA Nature Portfolios
PSA Photo-Journalism Portfolios

For information concerning any of the foregoing activities and for enrollment blanks, write to the Director of the PSA American Portfolios, Eldridge R. Christhill, Hon. PSA, APSA, Suite 406, 800 Davis Street, Evanston, Illinois.

include more foreground which, being closer, would be out of focus. This is a common situation, hence we frequently trim off an out of focus foreground.

"The above is only one factor contributing to the apparent definition in a print. Here are some of the others:

LENS DESIGN—degree of correction, flare, etc.

ENLARGING SYSTEM—precision of optical system, type of illumination.

EXPOSURE—in the negative, halation, etc.

PRINTING PAPER—surface, contrast, after treatment, etc.

NATURE OF SUBJECT—detail, contrast gradients, "brilliance," etc.

PSYCHOLOGICAL FACTORS—purpose of the picture, mood, etc.

"So you see, boys and girls, the matter is quite simple. As Mortimer Snerd would say, 'Yup, that's the way it goes!'"



Wolf greets Wolfe. Paul J. Wolf, APSA, Hawthorne, N. Y., of the Color Division left and Paul J. Wolfe, APSA, Butler, Pa. of the portrait portfolios on the right trying to figure out means to eliminate confusion over their names. Quellmalz photo.

HIGHLIGHTS FROM Portrait Portfolios

PAUL J. WOLFE, APSA, Associate Editor

Our Portrait Portfolios are open for membership to every PD member, and if you are not a member, you are passing up one of the most stimulating activities of the organization. It's as easy to join as taking off your hat. Simply write the Director and he will forward you a Technical Data Sheet. This is filled in and returned with your portrait. One dollar should accompany this to care for your service charges for a year.

Almost as soon as your portrait and data sheet are received, your entry will be placed in one of our Portrait Portfolios and a card mailed to you by the Director advising you which circle it is. Later the secretary of your group will send a card telling you the approximate date you may expect to receive your portfolio. When it arrives you will enjoy it for five full days and forward it on to the next member.

As soon as your enrollment begins, your name is entered on the subscription list for our quarterly publication, "Portrait Pointers," edited by Maurice H. Louis. You will receive it without charge for the term of your membership in our group.

"Portrait Pointers" has grown into a paper full of meaty substance for those interested in making better portraits. It is of interest to note, according to "Portrait Pointers," that 20% of our membership are professionals, that housewives come second, and that such occupations as artists, bankers, beekeepers, bakers, clergymen, carpenters, die makers, florists, attorneys, mailmen, musicians, optometrists, policemen, publishers, professors, pharmacists, surgeons, surveyors, school supervisors, theatre managers, writers, and on and on make up those who enjoy and profit from our portrait-taking family.

Many excellent writers give "Portrait Pointers" a helping hand. We are proud to present an article by George B. Wright,

editor of *American Photography*, entitled "Characters" Versus Character in our most recent issue. It's an article worth the entire enrollment price to our portfolios. Here is a single quotation from his excellent writing: "The sympathy we need to turn out pictures of people rather than pictures of their surfaces has to be deep and real. If we don't really like people, if we don't have a warm out-going feeling in dealing with them, we will never be able to reveal their character. To take an example somewhat at a tangent, look at Barbara Morgan's wonderful pictures in 'Summer's Children.' Her very real love for children shines all through it and is the prime reason for the effectiveness of the pictures. Your feelings toward your sitter shine back from the picture."

Each Portrait Portfolio has its own commentator. They are all top-notch names synonymous with the making of splendid portraits. They give freely of their time, their efforts and their knowledge to help each portfolio member learn the craft wisely and produce better portraits.

Among the portrait portfolioists enjoying the grand PSA Convention in Detroit were Fred Carver, Chester, Va., F. L. Purring-ton, Wheaton, Ill., Edith M. Royky, Sioux City, Ia., Charles H. Tipple, Oneonta, N. Y., Caryl R. Firth, Trappe, Md., Cy Coleman, Detroit, Mich., Carey Carpenter, Baton Rouge, La., Edna V. Tucker, Utica, N. Y., J. G. Whetson, Youngstown, O., Coleman Dixon, Tallahassee, Fla., Isaac Mitchell, Erie, Pa., Sketts Biber, Spartanburg, S. C., Helen Albertson, Sioux City, Ia., R. E. Collins, Connersville, Ind., J. B. Lewis, Dearborn, Mich., Carl C. Shutt, Warren, O., Edward W. Krem, Dayton Plains, Mich., George J. Munz, Bergenfield, N. J., Catherine Dorr, Brooklyn, N. Y., John O. Hay, Cleveland, O., Herbert Jackson, Signal Mountain, Tenn., Calvin R. Hobart, Pontiac, Mich., Esther Slonneger, Peoria, Ill., James Bier, Jr., Butler, Pa., Laurie Mark- uson, Tariffville, Conn., Al Weber, Bridge-ton, N. J., Mable Lee Dixon, Tallahassee, Fla., Alfred Doser, Ray City, Mich., Pres-cott V. Kelly, Birmingham, Ala., Wally

Hagemann, St. Louis, Mo., James F. Kreps, De Forest, Wis., Belle McMillen, Jackson, Mich., Morris Germaine, New York, N. Y., and of course, Maurice Louis of New York and Paul Wolfe of Butler, Penna.

News of the Pictorial Division

GEORGE GREEN, Associate Editor

It's an old story about all brides being beautiful. But very rarely does the bride go to the altar before she has had expert advice on how to conduct herself. If it is one of those dress affairs you can bet your last stud button that she has been analyzed thoroughly from the correct shade of face-powder to taking in an extra one thirty-second of an inch around the bodice of her gown. It may take days and weeks of trying on, pinning-up, matching and blending and harmonizing cosmetics and it is topped off with a complete analysis immediately prior to the wedding day. Maybe, that's why all brides are beautiful!

Just think of it. A summation of why all brides are beautiful, complete in one paragraph!

What has this to do with Personalized Print Analysis? A print is like a bride. We would like all of our darkroom endeavors to be so beautiful that one cannot help exclaiming with joy upon beholding them. The labor of love is such that it should never be lost. Perhaps all it requires is a different paper, a little flashing, a slight cropping or just toning to bring it to perfection. But you are unable to complete it because you don't know the facts of darkroom life.

You need personalized print analysis if you want your pictures to be things of beauty. You can have this analysis free of charge if you are a member of the PSA PD. One of the nation's top pictorialists is at your beck and call. Upon receipt of your prints, 5 x 7 or 8 x 10 plus a contact print of the entire negative, J. Elwood Armstrong, FFSA, will go to work. He will make a comprehensive study of your photographic efforts and then, by return mail, will give you the low-down on how to make your prints walk down the aisle to the altar of success.

Send the prints to J. Elwood Armstrong by first class mail, including return postage and label. Print your name and address on the back of each print plus the title of the picture, technical data and pertinent information. Also include a brief statement of the idea or purpose behind the picture, and the purpose for which it was taken (club contest, salon, etc.). The address is 17402 Monica, Detroit 21.

New 1 Star Exhibitors
Harold R. Davis, Elmira, N. Y.

Advanced from 1 Star to 2 Star
Anders Aalborg, Memphis, Tenn.
Henry W. Barker, Glenbrook, Conn.
William E. Bush, San Luis Obispo, Cal.

With the publication of this month's Star Exhibitors, Glenn E. Dahlby takes over the Award of Merit directorship. He will be extremely happy to tell you all about the group; what it signifies, how you can become one of those "who have arrived" pictorially, and how you can carry its awards with you wherever you go. Glenn, like his predecessor, Warren Lewis, lives in the Chicago area. The address is 419 South Taylor Ave., Oak Park, Illinois.

Organizational Change

In order to facilitate the handling of certain duties in the Pictorial Division, the office of Secretary-Treasurer, formerly held by Lewis T. Reed, APSA, has been split into two offices, that of Secretary and Treasurer. Miss Stella Jenks has been appointed to the office of Secretary of the Pictorial Division, and Lewis T. Reed continues as Treasurer.

In addition to her new duties as Secretary, Stella will continue to serve as Editor of the "Pictorial Digest."

December is here and the end of the year is near at hand. For most camera clubs it is the middle of the season, but if your club is one of the rare ones that begins a new year's program in January, or if it is one of those improvident organizations that live from hand to mouth, then you may be looking for some of the program material that PSA has for its member clubs.

Recorded Lectures

First of all, there are the recorded programs that are becoming increasingly popular. A wide-spread organization will soon be in operation to improve the service to outlying clubs.

The club receiving a program is expected to furnish a tape recorder and a projector, together with operators. Sufficient time is allowed in delivery so that the two operators can have a test rehearsal to be sure the show will go off smoothly.

A list of available Recorded Lectures, together with the service charges for each, is printed elsewhere in this section, and we suggest that you write to Philip Maples for possible dates and other up-to-the-minute information.

Portfolio Clubs

Sten Anderson reports a new Portfolio Club that is working in connection with the Berkeley Camera Club of Berkeley, California. It was organized Aug. 21, 1951 and the president is Challis Gore. The sponsor is Boris Dobro.

Mr. T. K. Chang, a member of the Lincoln Portfolio Club won first place and a gold medal in the Annual Photographic Exhibition at the Nebraska State Fair. Chester R. Frey, also of the Lincoln Portfolio Club, received second place and a silver medal. The judges were Herman



Officials of the PD in the portfolio room at Detroit. Gene Chase (left), Chairman, Stella Jenks and Lewis T. Reed discussing PSA. Photo by Fred Quellmaiz.

Krohn, president of the Omaha Lens and Shutter Club; Stanley D. Sohl, president of the Lincoln Portfolio Club; and Claire C. Poulson, secretary of the same club and member of the Western Electric Camera Club of Lincoln. A hundred prints were submitted in the Salon Class, while sixty-two were entered in the Amateur Class. For the eighth year, Sten Anderson was Director in Charge of the Exhibition.

American Exhibits

These one-man shows have been immensely popular during the past year, and are usually in demand at that season when

members are slow in bringing their prints to club meetings.

New collections are constantly being added, and it would be well to write to Fred Fix, Jr. for the latest list. Among the old favorites are:

Seascapes by Hogan, Portraits by Crosssett, and Human Interest Pictures by Mansfield. There are also some wonderful pictures made by the Photo Guild of Detroit and Standard Oil.

Camera Club Print Circuits

One of the best ways of keeping the club interested is to have a print exchange. If you live in a city where there is a rival club (a friendly rival that is) you will have no trouble in arranging such a program, but many clubs are not so happily situated, and for them there is nothing like a Camera Club Print Circuit.

Three of your club's best prints and a dollar will put you into a Circuit. Write to William R. Hutchinson for an application blank.

Judging Service

When you have an important contest and need some unbiased judges, get them from out of town. For some reason camera club members will accept the decision of strangers without a murmur. And that's something! Write Henry McKay and see if he can't find a judge or two in your neighborhood.

PSA Recorded Lecture Program

The Recorded Lecture Program of the Pictorial Division offers the following programs for your club.

No. 1. An Analysis of Recognized Salon Prints by Ragnar Hedenvall, APSA

No. 2. Commentary on Recognized Salon Prints by Morris Gurrie

No. 3. Outdoor Photography by D. Ward Pease, FPSA

No. 4. Still Life by Ann Pilger Dewey, APSA, Hon. PSA

No. 5. New Prints for Old by Barbara Green, APSA

SPECIAL Photography of the Nude by P. H. Oelman, FPSA

A deposit of \$25.00 should accompany an order. A service charge is made for each Lecture. The SPECIAL costs \$10.00 and should be ordered directly from Mr. Oelman. For clubs which are members of PSA but are not affiliated with the PD the charge is \$6.50. Clubs which are affiliated with the PD will be charged \$5.00. Clubs or groups not members of PSA will be quoted prices on request to the Director.

For Nos. 1 to 5 order from Philip B. Maples, Director, Recorded Lecture Program, 29 Spring Street, Brockport, New York.

For the SPECIAL please contact: P. H. Oelman, FPSA, 2505 Moorman Avenue, Cincinnati 6, Ohio.



WALTER E. PARKER, Associate Editor

The International Exhibits have been received with great interest throughout the United States wherever they have been shown, and those sent to the foreign countries have stimulated similar interest and understanding there. We are con-

stantly being asked for more American shows to exchange with the foreign shows in the United States.

We would like to have a backlog of American shows to be sent abroad and PSA club members are being asked to arrange for an exchange show. If your club can assemble such a show consisting of 25 to 50 prints, please contact the Director of this activity.

During the past year over 80 clubs and photographic groups have displayed one or more of the International Exhibits. The Hong Kong show leads in the number of times it has been displayed—eleven clubs have seen this unusual show during the past year. But there are 15 other shows available for you to display or to use as a basis for comment by a photographer close to you.

The Italian Show has been returned to Dr. Fioranti of Turin, Italy, and negotiations are under way for a new show from these photographers. The Australian Show is being broken up into two shows of 49 prints each as there were too many prints for most clubs to handle successfully. The newest show, "Meet the Australians," consists of 95 prints and has been booked at the Eastman House in Rochester for fall showing. This will then be broken up into two shows and circulated throughout the United States.

There are no service fees for the presentation of these shows, clubs are required only to pay the postage on to the next club or to and from the Director. If you are interested in securing one of these fine shows for your club program, contact Walter E. Parker, Director, PSA International Exhibits, right away giving him the dates and the shows you wish.

Committee Appointments

Serving with Walter Parker on the International Exhibits Committee are Robert M. Keith of Chicago, Illinois, who is the Assistant Director. Many of you had the pleasure of meeting Bob at the Detroit Convention. He is a Director of the Chicago Area Camera Clubs Association, a member of the Jackson Park Camera Club, and a teacher of color processing of dye transfer and carbro. The Director has also appointed Mrs. Marilee Alcivar of Chicago as Secretary of this committee.

Coming Salons Agreeing to Follow PSA Recommendations

NOTE: M—monochrome prints, C—color prints, T—color transparencies, SS—stereo slides, L—monochrome slides, A—architectural prints, S—scientific or nature prints. Entry fee is \$1.00 in each class unless otherwise specified. Recognition: The monochrome portions of salons listed have Pictorial Division approval. Check salon list of appropriate division for recognition of other sections.

Japan (M,T) Exhibited Jan. 15-22 in galleries of Mitsukoshi, Tokyo and later at other Japanese cities. Data: G. Ueno, The Assahi Shinbun Bldg., Yarakuchō, Tokyo, Japan.

Milwaukee (M,T,SS) Closes Nov. 24. Exhibited Dec. 6 to Jan. 7 at Layton School of Art. Data: R. J. Lauer, c/o Milwaukee Glove Co., 807 S. 14th St., Milwaukee 4, Wisconsin.

Springfield (M) Closes Dec. 4. Exhibited Jan. 2-23 at Museum. Data: Salon Secretary, Geo.

Walter Vincent Smith Art Museum, Springfield 5, Mass.

Havana (M,T) Closes Dec. 4. Exhibited at the club, Dec. 14-Jan. 11. Data: Club Fotográfico de Cuba, O'Reilly 366 alons, por Compostela, Havana, Cuba.

Des Moines (M) Closes Dec. 8. Entry fee \$2.00. Exhibited Jan. 1-21 at club and Des Moines Art Center, Des Moines YMCA and Camera Club, YMCA, Des Moines, Iowa.

Minneapolis (M,C,T) Closes Jan. 14. Exhibited at American Swedish Institute. Data: Warren Anderson, 123 S. 7th St., Minneapolis, Minn.

Rochester (M,C,T,S) Documentary prints in M or C, large transparencies. Closes Feb. 14. Exhibited Mar. 7-30 at Rochester Memorial Art Gallery. Data: Dr. Robt. F. Edgerton, 11 Fire-side Drive, Rochester 18, N. Y.

Philadelphia (M,T) Closes Feb. 16. Exhibited Mar. 9-30 at Free Lib. Data: Miss Marion C. Knight, 1123 Harrison St., Philadelphia 24, Penna.

Worcestershire (M,T) Closes Feb. 20. Exhibited Mar. 15 to Apr. 5 at City Art Gallery. Data: C. J. Marshall, 57 The Tything, Worcester, England.

Other Salons

Ahmedabad (M) Exhibited beginning Dec. 22.

Data: U. S. Dalal, Niharika, Pratima Studio Lal Bhuvan, Relief Road, Ahmedabad, India.

Lincoln (M,A,S,T,L) Exhibited Dec. 8 to Jan. 5 at Usher Art Gallery. Data: Lincoln Camera Club, 5 Monko Road, Lincoln, England.

Madrid (M) Exhibited during December. Data: Secretary, Real Sociedad Fotográfica de Madrid, Principe 16, Madrid, Spain.

Hong Kong (M) Exhibited Dec. 3-8. Entry fees waived. Data: Photographic Society of Hong Kong, Mr. Se-Leuk Kaan, Hang Shing Co. Ltd., 52 Bonham Strand East, Hong Kong, China.

Lucknow (M,C,T) Closes Dec. 15. Exhibited during Feb. and Mar. Data: S. H. H. Razavi, 10 Cantonment Road, Lucknow, India.

Bordeaux (M) Closes Dec. 20. No entrance fee. Exhibited Jan. 18 to Feb. 4 at Galerie Des Beaux-Arts. Data: Photo-Club, 53 Rue des Trois-Contils, Bordeaux, France.

Adelaide (M) Closes Jan. 26. Exhibited Mar. 7 to May 3 in Royal Adelaide Exhibition. Data: A. C. Wilcox, 12 Pirie Street, Adelaide, So. Australia.

So. Africans (M) Closes Mar. 15. Exhibited May to August at Johannesburg and leading cities. Data: Peter Marples, P. O. Box 7024, Johannesburg, So. Africa.

PSA COLOR DIVISION

GEORGE F. JOHNSON, APSA

Forestry Building, State College, Penna.



John G. Mulder, H. J. Johnson and Fred Bond were among the PSA notables at the head table at the Detroit CD luncheon attended by 156 members. Quellmalz photo.

Color at Detroit

Once again the Color Clan gathered, this year at Detroit, for what turned out to be the biggest and best Convention yet. CD members came from Los Angeles and from Annapolis, from Tulsa and from Toronto, until it seemed that everyone you'd ever heard of was there. In addition to the thrill of meeting people who, up to now, had been only "names," a lively and varied program, filled with interesting topics, caused time simply to whiz by. Never have four days gone by so rapidly, and never have four days been so filled with sustained excitement.

Wednesday, Oct. 10th, the Convention formally opened with registration, but quite a crowd beat the gun and registered on Tuesday evening. The long line of eager members waiting to register was a swell place to renew old acquaintances and to make new friends, and Detroit's plan for a colored star to be affixed to the name tag, to tell of the various divisional affiliations, was a fine idea. Quite a few turned out to be "6-star" men, who were

affiliated with all PSA Divisions. Our CD star was first, alphabetically and otherwise, and it was interesting to see how many people who were "big names" sported it proudly. These preliminaries took up Wednesday morning, and early afternoon was an open meeting where the members received a report by the Board of Directors on what had been done as a result of the suggestions made at last year's open meeting in Baltimore. President John Mulder, FPSA (a CD man, too) passed his gavel of office to incoming President Norris Harkness, APSA. After that, all hands went over to Windsor, Ontario, Canada, in a long string of buses, complete with police escort, for an afternoon of shooting the famed Detroit skyline, and followed up with fried chicken which had been masquerading as a "South of the Border Barbecue." A Pipe Band in kilts, which included a pretty girl in laces and velvets, serenaded the crowd and willingly posed for pictures.

After the dinner all fresco was finished, and many second cups of coffee downed, the conventioners again mounted the

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buses and went to the Detroit Institute of Arts to see the accepted prints and slides, and to hear Col. George W. Goddard's acceptance speech on receiving the Society's Progress Medal Award.

The showing of the accepted slides came after Col. Goddard's talk, and credit for the fine presentation goes to Leonard A. Thurston, color chairman for the Detroit committee. The slides were accompanied by a musical background with the program of recorded music being prepared by George W. Blaha, APSA, and it gave just the right mood to the show.

Thursday opened with Warren H. Savary's fine talk, "Long Focal Length Lens Problems and Bird Photography," featuring many prize-winning slides of birds, made in all sorts of places, from his backyard to the Everglades. A large group turned out, and many stayed on for the succeeding program on Stereo by the David White Company of Milwaukee. These two programs filled up the morning, and in the afternoon it was back to the buses again for a ride to nearby Dearborn, to Greenfield Village, an all-afternoon visit to the famous outdoor museum that groups together many 18th and early 19th Century industries. The weather was fine, the crowd enthusiastic, and full advantage was taken of the brilliant autumn color. Everywhere you looked, people were snapping shutters. And there was plenty of good material, too.

Thursday evening brought two fine programs: first, a 16mm color film entitled "Karambi," the story of a big-game hunt in far-away Kenya; and second, our own Fred Bond, APSA, on "Color Composition as Applied to Color Photography." The magic of Fred's fame filled the Grand Ballroom, while he explained the "hows and whys" of color composition in relation to pictures. The talk was as non-technical as possible, and quite a few people seemed surprised that they could not only follow the talk, but could really understand it.

Friday morning was given over to the Johnny Appleseed program, with Arthur Underwood, FPSA, officiating for CD. Each Division had a "Johnny," all were decked out as comedy farmers, and at the intermission baskets of apples were passed around. Lots of fun, the panel of "Appleseeds" kept the joint jumping. They even answered serious questions, too.

Lunchtime brought the 3rd Annual Color Division Luncheon, with 156 enthusiastic members present. As is our pleasant custom, there were no formal speeches, although Norris Harkness and John Mulder responded to their introductions. High spot of the luncheon was the presentation of a CD Service Medal (the third ever awarded) to Leonard A. Thurston for his fine work as CD program chairman for the Convention. George F. Johnson, APSA, CD Chairman, made the presentation. Then the roll of all present was called by Paul J. Wolf, APSA, CD Secretary, each arising to take a bow as his name was called. It was unanimously agreed that once again Mr. & Mrs. A. C. Klein had arranged a grand luncheon, and Alf's satisfaction was more than evident as he went

around happily telling all comers that this year was double last year's attendance.

The afternoon brought a combined CD and TD program, a Color Clinic with H. Clyde Carlton, APSA, as moderator, and a panel of technical experts of such stature as Harold Harsh, APSA, of Ansco; Howard Colton, FPSA, of Kodak; Maurice LaClair, Carl Thaxton and Harry Lerner, APSA, to answer questions. This was followed by a Color Slide Clinic under the direction of A. C. Klein, APSA, who presided over a panel of topnotch color slide makers in analysis of some of the rejected slides from the PSA International Exhibition, as well as slides brought for the purpose by the panel. The panel consisted of Louise Atnew, Eugenia Buxton, Helen C. Manzer, APSA, George W. Blaha, APSA, Charles A. Kinsley, APSA, Arthur Papke, Warren H. Savary and Paul J. Wolf, APSA. Evening brought the Chicago Color Camera Club's dinner at Stouffers, with 86 regular and associate members and guests present. The balance of the evening was not a CD program, but almost all the CD people went to hear Yousuf Karsh, FPSA, tell about his experiences as a portrait photographer and to see a demonstration of newer methods of photography. The Air Forces staged a demonstration for us, and Col. Goddard really went all out to put on a show.

Saturday morning featured the second showing of the accepted slides, followed by Helen C. Manzer's talk, "Unbelievable Utah," illustrated with many slides that have helped make Mrs. Manzer one of our most successful exhibitors. Afternoon brought Roger J. Ross on duplication of color transparencies, followed by Maurice LaClair on "Lighting for Color Portraiture," in which this successful professional demonstrated the methods by which he has gotten to the top.

Saturday evening, of course, brought the Grand Finale of every PSA Convention—the Honors Banquet. Many Color Division members were honored, as a glance at the Honors List will reveal, and in addition the Clerk Maxwell Trophy was awarded to C. P. Taylor, of Towson, Maryland, for his fine color print "Bittersweet." The trophy, a ceramic plaque, was accepted by George Rowan, publisher of "The Camera," as proxy for Mr. Taylor, who could not be present. What with all the speeches, and the long Honors List, it was past midnight before the crowd agreed that it was indeed all over . . . another successful PSA Convention was history . . . and plans for New York in '52 were started.

PAUL J. WOLF, APSA

Tips for the Lecturer

An increasing number of color photographers are presenting their slides in the form of illustrated talks for church, lodge, garden, and many other groups.

How to plan these talks, secure the proper set-up in the lecture room, and make the maximum impact on the audience are important matters worth serious consideration. A book could be written on the subject. Here are only a few tips and suggestions for the beginner:

1. Have the set of slides organized in a logical sequence. Following through the seasons on outdoor life, presenting a trip as a travelogue, or showing events in historical order are possibilities in securing an effective sequence. Do not jump illogically from one subject to another, and avoid the situation where "just a collection of unrelated slides" is shown.

2. Be familiar with each picture so that a prompt explanation can be made without hesitation.

3. Arrive at meeting place at least a half hour in advance of the meeting. This will enable checking electric outlets, getting sturdy table for projector, and placing screen at best location. Many times even the chairs can be rearranged to improve viewing conditions, and more satisfactory ventilation of the room can be planned.

4. Have projection equipment set up and ready to go before formalities get under way. This will enable the show to proceed at proper time without unexpected delay. Especially strive to avoid movement of audience and other distractions just when everybody is relaxed and ready with keen anticipation for the pictures.

5. If you are relying on a projectionist, be sure he or she understands the order of presentation and how to operate the projector smoothly. Arrange some means for indicating change of slides without a loud tap of a pointer on the floor. Often just lowering the voice with a glance at projectionist will do the trick very well.

6. Avoid long detailed descriptions of the pictures while on the screen. Keep the show moving right along. Be ready with comments just as soon as the picture appears. All comments should relate rather closely to the picture. This is no place for a remark such as "this reminds me of a story" which is unrelated to the picture on the screen, but is told in great detail while the audience "waits." Avoid repetition of such remarks as "this picture shows."

7. Conclude your presentation while the audience is still interested in seeing more pictures. This seems to be the best guide to follow on the problem of duration of an illustrated talk. For the average audience with the average subject, this probably means a show of not more than 40 or 50 minutes. Some can show 150 or more slides and hold an audience very well for more than an hour. Usually, this is a fortunate combination of very interesting slides and a clever lecturer.—G. F. J.

Sky Color

Perhaps no phase of color transparencies elicits more critical evaluation than that of sky color. For some reason or another, most colorists too readily assume that because an expanse of blue sky is apparently over-powering in the picture, the film used is over-sensitive to blue, hence distorted.

In defence of the film's rendition of sky tone, the writer would like to stress three important factors. In the first place, it should be obvious that if the film is over-sensitive to blue, then ALL the colors in the picture should be proportionately bluer, which condition would have a tendency to

unify the color effect and detract from the sky's intensity. This can be illustrated by the simple expedient of projecting the offending slide on a screen, then viewing it through a pale blue filter of glass or gelatin.

Secondly—and this point is very important—it should be made clear, that of all the objects and surfaces photographed with light, the sky is the ONLY one that has no reflectiveness when devoid of clouds or mist. This being so, is it not reasonable to suggest that when a scene is "shot" in color on a brilliant summer day, every object reflects the yellow-orange in the sunlight, with the exception of the sky, the tone of which is thereby intensified.

Finally, the orange tone of sunlight is a perfect complement to a clear blue sky, and experienced colorists and artists are fully aware of the value of playing complementaries against each other to intensify the color effect.

To illustrate this point, the writer suggests the following experiment: arrange a group of orange-yellow flowers against a clear blue sky in brilliant sunlight, then "shoot" them in color. Repeat the procedure exactly, but shield the flowers from the sunlight. The writer has never set up an experiment of this nature, but is willing to wager that the sky in the second color shot will appear less blue than the first.

In the realm of science, color can be measured and standardized, but fortunately man views and evaluates it psychologically. This tends to enlarge our color horizon!

—JAMES H. ARCHIBALD

Note of Appreciation

"Just a short note of congratulations on the fine CD section in the September 1951 PSA JOURNAL. In my humble opinion it was the finest copy of the JOURNAL I have ever seen. It was a topnotch selection of writers and material, well handled, and broad enough in scope so that everyone interested in color work would find ample food for thought. You, your Color Division editorial committee, and the PSA JOURNAL editor have certainly set a very high standard for future color editors to shoot at."—Letter to Geo. F. Johnson from Lloyd Robinson, Redondo Beach, California.

Coming Color Exhibitions

- Wilmington, Feb. 3-25, deadline Jan. 13.**
Four slides, \$1. Forms: Mrs. Don Tribit, 3 S. Lake St., Elmhurst, Wilmington, Del.
- Chicago Nature, Feb. 1952, deadline Jan. 15.** Four slides (up to 3 1/2 x 4), \$1. Forms: Blanche Kolarik, 2824 S. Central Park Av., Chicago 23, Ill.
- Valparaiso, Feb., deadline Jan. 15.** \$1, four slides. Data: Carlos Quevedo, Club Fotografico y Cinematografico de Valparaiso, Ave. Pedro Montt 1740, Valparaiso, Chile.
- Minneapolis, Feb. 12-14, deadline Jan. 21.** Four slides, \$1. Forms: Warren Anderson, 123 S. 7th St., Minneapolis, Minn.
- Philadelphia, March 8-30, deadline Feb. 16.** Four slides, \$1. Forms: Clarence A. Rossman, 1637 S. 54th St., Philadelphia 43, Pa.

Print of the Month Contest

The August Print of the Month Contest was judged at Philadelphia, Pennsylvania with the judges Charles Heller, Hon. PSA, APSA, Arnold V. Stubenrauch, APSA, and Dr. John P. Benus, FPSA, announcing the following results:

Beginners Group, Action Class

1st—Harvey V. Fondiller—No title

Beginners Group, Pictorial Class

1st—Harvey V. Fondiller—No title

2nd—Robert W. V. Hawkins, "Skylon Silhouette"

Beginners Group, Nature Class

1st—Mrs. Julia Foss, "Ducky World"

2nd—Robert W. V. Hawkins, "My Dog"

Advanced Group, Action Class

1st—Irving Rosen, "First One There"

2nd—Wesley I. Reid, "Caught in the Act"

Advanced Group, Pictorial Class

1st—Anders Sten, "Everyday Chores in the Village"

2nd—Wellington Lee, "Dreaming"

Advanced Group, Nature Class

1st—Irving Rosen, "Brothers"

2nd—Edwin Howard, "Baby Song Sparrow"

September Contest

Due to insufficient entries only one prize was awarded in each class in the September Contest.

Beginners Group, Pictorial Class

Mrs. Julia Foss, "Daisy and Laurie"

Beginners Group, Action Class

L. D. Hanson, "Time Trials"

Beginners Group, Nature Class

Ralph McCain, "Bananas to You"

Advanced Group, Pictorial Class

Earle W. Brown, "Before the Race"

Advanced Group, Action Class

Irving Rosen, "Getting Thru"

Advanced Group, Nature Class

Miss Eugenia Buxton, "Where's Mamma?"

Final Results

The annual judging of the Print of the Month Contest was held at Detroit, Michigan with the following results:

Beginners Group, Action Class

1st—Masaru Taketa, "Fore"

2nd—Harvey V. Fondiller, no title

3rd—Masaru Taketa, "Hard Work"

Beginners Group, Nature Class

1st—Chester W. Hodgson, no title

2nd—George J. Munz, "American Prince"

3rd—Fred M. Itagaki, no title

Beginners Group, Pictorial Class

1st—Chester A. Smith, no title

2nd—Manual Ampudia, "Madonna"

3rd—Rolan Duffield, "A Study in Lines"

Advanced Group, Action Class

1st—G. L. Weissenburger, "Playful Porpoises"

2nd—G. L. Weissenburger, "El Toro"

3rd—Dr. Victor A. Lookanoff, no title

Advanced Group, Nature Class

1st—Everett W. Saggus, "Whip-Poor-Will"

2nd—Arnold Kidson, "Stepping Out"

3rd—Wellington Lee, "Butterfly"

Advanced Group, Pictorial Class

1st—Charles Buker, "Symbols of Strength"

2nd—Wellington Lee, "Abstract Dance"

3rd—Dr. Victor A. Lookanoff, no title

The Print of the Month Activity will be under the direction of John R. Hogan, starting in January 1952. Watch PSA JOURNAL for startling new developments!

STEREO

DON BENNETT

Well, the Viewmaster stereo camera was given a preview at the San Francisco Trade Show of the Master Photo Dealers' and Finishers' Association in early October. Jack Deschin will probably have a full report in his column since he was there and we weren't, but he'll probably forgive us if we tread on his department stereo-wise.

The new camera uses standard 35mm cartridges but there the similarity ends. The camera makes up to 69 pairs on a 36-exposure roll, pictures, but not pairs, side by side on the width of the film. You cut them out with a die-cutter and slip them in a reel quite like the Viewmaster stereo discs and use the regular Viewmaster viewer.

This outfit will probably have wide acceptance, especially from people who have a library of Viewmaster stereos. We can't help but regret the addition of still another size to the stereo field. Especially one that is exclusive. After all, there is a degree of interchangeability between Busch, Realist and Videon.

* * *

There's a new outfit for stereo movies, too. Made by Nord in Minneapolis. A beam-splitter, same principle as the Stereov and Stereo-Tach, is placed over the movie camera lens. Eye separation is fixed by the beam splitter. Then a similar device is placed in front of the projector lens. Usual goggles and . . . stereo.

As far as we know it is the first outfit offered on a commercial basis for 16mm use. Herb McKay and a gentleman named Ramsdell in Worcester, Mass., have both made stereo movies on 16mm, but neither attempted commercial production of their outfits.

Jack Norling, of Loucks and Norling Studios, made a stereo movie for Chrysler which was used at the 1939 World's Fair in New York. A fascinating bit of stop motion in which a car assembled itself bit by bit in stereo. This film was shot with a pair of 35mm studio cameras strapped together. Viewing by Polaroid filters, as usual.

This new outfit looks like it might work,

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thought we haven't seen it, or any films made with it.

Stereo Group of the Jackson Park CC of Chicago looks like it might be a wide-awake outfit. They have 29 members and meet the first Wednesday at 6200 S. Kenwood at 8 PM. Slides are projected for all to see and they screen both members' slides and those of top-notch workers outside the group.

From their bulletin we get a couple of dates. You may read this in time to catch the Third Lighthouse Exhibit. Stereo projections at the Art Institute Dec. 4 to 9. Milwaukee's second show runs from Dec. 6 through Jan. 7. (Entries close Nov. 24.)

How many more of you stereo clubs or parts of clubs are running around loose? Why not let us publicize some of your meetings for you? Only thing is this—we must have the dope by the fifth of the second month preceding the date of issue. For March meetings we must have it by January 5. Fred Quellmalz always hopes he'll get our copy by the 15th so he can start building a magazine and we want a few days, too, to digest what we have. You can send it direct to us at 28 Leonard St., Stamford, Conn. Just get it in early, boys and girls.

Curious problem coming up some day soon. We've remarked before that lots of manufacturers are rushing into stereo and we are glad to see it. The more the merrier.

However, some are rushing a little too fast! We have in mind the slide-mount makers. Several have rushed onto the market with slides which have a plastic of some sort over the slides. One is all transparent plastic, another used a thin plastic sandwich, still another used plastic in lieu of glass.

These designers apparently don't know that thin plastic sections defy polarization, and you can't project through them in stereo systems using polarizing filters to separate the images for each eye. What actually happens is that the plastic film depolarizes the light.

For use in viewers these mounts are very good. For projection, not so good. Glass doesn't depolarize and neither does plain air.

Some day before too long some wise guy will come up with a stereo projection system that doesn't cost like two cameras. It will run nice and cool, be easy to adjust and will help spread stereo like 35mm color slides spread as more and more projectors become available.

Pardon us for bringing this one up, we're reaching so far back for it. . . .

With sharpness of image so important in stereo it behooves us to always be prepared and not depend entirely on the short focal length of our lenses.

There is an old still trick from the days when emulsions were very, very slow and

a man wanted to be ready to grab a shot if it happened right in front of him.

The trick is simply to always leave your lens focusing scale set on the hyperfocal distance. In that way, everything from half the hyperfocal to infinity will be acceptably sharp. Some cameras have a hyperfocal scale engraved on the camera, or you can get it from any standard data book. Pick the table that covers your focal length of lens. If it doesn't list the hyperfocal as such, look at the infinity table. The nearest point in focus when the lens is set on infinity is the hyperfocal, and if you focus on that, then everything from half that distance to infinity is sharp, to repeat ourselves for emphasis.

The scale in the lens shade of our Realist says that at f/5.6 (average stop for daylight work) the hyperfocal for the 35mm lenses of that camera is 28 feet. So by setting the scale just a hair past the 25-foot mark we have a range from 14 feet to infinity.

So, when you finish a series of shots, set your focusing scale to the right mark and you are set if something comes up rather unexpectedly.

David White Co. have asked us to request all Stereo-Realist owners to be sure they have registered their cameras so they will receive the Stereo-Realist News, the third issue of which is now ready. Just send a postcard with the serial number of your camera to the factory and ask to be put on the mailing list.

NEW MEMBERS SEPTEMBER 1951

New Member	Nominating
Akin, Russell B., Montclair, N. J. (T)	Membership
Anstett, Miss Dolly, Chicago, Illinois (C)	Membership
Atchison, Miss Linda, Detroit, Michigan (C)	J. Elwood Armstrong
August, George, Seattle, Washington (J)	Membership
Bagley, Dr. E. S., Manhattan, Kansas (C)	Joe Marshall
Barker, L. B., Ballston Lake, N. Y. (P)	Burage E. Stiles
Bass, Park, Cedar Rapids, Iowa (C)	James Riddick
Bechtel, Otto D., West Lake, Penna. (C)	Foster E. Moyer
Beckman, Orville J., Oklahoma City, Okla. (CP)	G. E. Fiehl
Beekley, III, W. Mason, Deerfield, Mass. (CP)	Membership
Bellville, William J., Albany, N. Y. (CT)	Membership
Benderky, Aaron, Selma, Alabama (P)	H. Jack Jones
Bennett, Russell L., Butler, Penna. (C)	Paul J. Wolfe
Bertuch, Frederick M., Livingston, N. J. (C)	Membership
Bonner, Henry, Omaha, Nebraska (C)	V. Spearman
Brockman, Dr. James M., Memphis, Tenn. (C)	Dr. W. W. Tribby
Bundy, Frank W., Los Angeles, Calif. (C)	Membership
Buswell, Bruce, Wichita, Kansas (CNPT)	Membership
Bryne, Charles W., Park Ridge, Illinois (C)	Membership
Caldwell, Miss Ethel, Wellsburg, W. Va. (CNJP)	Carl Mansfield
Calixto, Dr. Frank P., Scranton, Penna. (P)	C. N. Hutchinson
Caridi, Nino D., Palisade, N. J. (C)	Membership
Carpenter, C. E., Kansas City, Mo. (CJP)	Membership
Carver, Miss Irene Louise, Manhattan Beach, Calif. (CN)	Fred Quellmalz
Caversaugh, David E., Murray Hill, N. J. (CFP)	Fred Quellmalz
Chambers, Thomas B., New York, N. Y. (CFP)	Fred Quellmalz
Chang, Tsuen K., Lincoln, Nebraska (JP)	Stanley D. Sobl
Chapman, Larry E., Oakland, Calif. (CN)	Membership
Chazelle, Sgt. Adrien, San Francisco, Calif. (CT)	Membership
Che, Lucky, Hongkong (P)	Francis Wu
Chiba, Bain, Seattle, Washington (P)	Clarence T. Arai
Chitt, C. M. K., Bangkok, Siam (CMP)	Membership
Chiu, Yu Ting, Hongkong (P)	Francis Wu
Chrom, H. J., Olean, N. Y. (CP)	Membership
Clarke, Jr., Fred C., Woodstock, Vermont (PJT)	Membership
Clarke, Jr., James R., Concord, Mass. (CFT)	Lee A. Ellis
Cohen, Dr. Archie Robert, Clear Spring, Md. (M)	Tom Hirst
Crane, James T., Monongahela, Penna. (P)	Membership
Crawford, Hammond, Mantua, Ohio (C)	J. Robert Langlots
Dahl, Roland J., Bronxville, N. Y. (CT)	Membership
Dendahl, Henry, Santa Fe, New Mexico (CMN)	Membership
Dende, Richard A., Scranton, Penna. (M)	C. N. Hutchinson
Dewitt, Erma R., New Falls, N. Y. (P)	Wm. T. Small
Duberg, George A., New York, N. Y. (C)	Harry Haines
Dyck, P. E., Portland, Oregon (CN)	C. W. Getzenbauer
Eggy, R. F., Phoenix, Arizona (T)	Les Mahoney

New Member	Nominating
Engbert, John F., Rochester, N. Y. (N)	V. C. Otis
Erickson, Miss Evelyn E., Wheaton, Ill. (CNFMJ)	Membership
Evans, Marjorie, Berkeley, Calif. (P)	K. V. Arntsen
Fellows, Frank S., Tampa, Florida (P)	C. Verne Klintworth
Fields, Mrs. Ellmore L., Phoenix, Arizona (CN)	Les Mahoney
Flanagan, Miss Sue, San Angelo, Texas (PJ)	Lloyd D. Witter
Fleming, J. Rex, Denver, Colorado (PC)	Wm. A. Price
Fletcher, C. Scott, San Marino, Calif. (CMP)	Membership
Ford, M. D., Kankakee, Illinois (CN)	Membership
Fuchs, Roger F., Peoria, Illinois (C)	Membership
Fuller, C. Thomas, Catawissa, Penna. (CMP)	Philip Can
Gala, Bernard J., Normandy, Missouri (PJ)	S. Ashen-Berner
Ganta, Miss Florence, Texarkana, Texas (C)	Membership
Gard, Mrs. Chauncey H., Lynn, Mass. (CP)	Membership
Garretson, Warren E., Brooklyn, N. Y. (C)	Membership
Gibbs, Merlo A., Wyandotte, Michigan (P)	Lyall F. Cross
Godin, Erigene, Montreal, Canada (C)	Raymond Caron
Grimm, Robert L., Denver, Colo. (J)	Wm. A. Price
Guillotte, Miss Jeanne, Austria, N. Y. (C)	James Jay
Gurley, Fred G., Winnetka, Illinois (C)	Membership
Haines, Henry R., Visalia, Calif. (PCN)	Grant Dugins
Harbour, Thomas P., Santa Barbara, Calif. (P)	Boris Dobro
Harron, Beatrice R., New York, N. Y. (C)	Membership
Haskitt, R. M., Detroit, Michigan (PT)	Membership
Hathfield, William A., Harrison, N. Y. (P)	Fred Quellmalz
Helm, W. A., San Mateo, Calif. (MP)	Membership
Hepner, Marvin M., West Reading, Penna. (CNM)	Foster E. Moyer
Herd, Gert, Posttown, Penna. (CN)	Membership
Hill, Dr. Lewis R., La Grange, Illinois (CN)	Membership
Hollander, Al, Miami, Florida (CP)	J. L. Craig
Holgraf, P. W., Anchorage, Alaska (P)	Membership
Hood, Charles H., Brookline, Mass. (CM)	Membership
Hooper, Dick, Scarsdale, N. Y. (CN)	Harry Haines
Hopewell, Paul W., Cincinnati, Ohio (P)	Membership
Horner, Howden R., Montreal, Canada (C)	Raymond Caron
Horton, Mrs. Clara M., Carmel, N. Y. (PT)	Membership
Huber, Walter L., San Francisco, Calif. (C)	Walter A. Carter
Hughes, Ruby P., San Diego, Calif. (C)	Membership
Hurst, Francis C., Chicago, Illinois (C)	Membership
Hutchinson, Herbert L., Norfolk, Virginia (CM)	Membership
Jacobs, Jr., L. W., Fayette, Missouri (C)	Fred Quellmalz
James, Thomas Howard, Rochester, N. Y. (T)	Membership
Jenkins, Ben L., Wilkes-Barre, Penna. (C)	Membership
Jenkins, Roland L., New York, N. Y. (P)	Frank A. Fausbender
Johnston, W. Melville, Orono, Calif. (CP)	Boris Dobro
Johnson, Mrs. Hazel, Houston, Texas (P)	Wood Whitwell
Johnson, James E., Houston, Texas (T)	Wood Whitwell
Jones, Lt. Col. Charles S., Newburgh, N. Y. (CJ)	Dr. J. S. Anderson

FLASH COMES OF AGE WITH THE

Kodak

HERE'S the new, completely modern solution to all the basic photoflash problems—a series of co-ordinated units, built to professional standards, incorporating all the best in flash engineering, from which you select the exact combination that fits your needs and methods.

Kodak Ektalux is "flash grown up." It discards all outworn tradition. It's a professional's dream, a press photographer's delight. Its Flashholder is the first high-energy, battery-condenser unit that's scientifically designed for holding. Extensions are series-wired—so there's no spotty firing, no lamp out of step. At 45 volts, the big Ektalux condensers will kick off as many as seven lamps, strung out over more than a hundred feet of slim cable, in perfect synchronism. New circuit refinements give your flash shutter special protection. And you can team Ektalux with any press, professional, or better-grade amateur camera.

Rugged, Yet Light And Compact—Every part of the Kodak Ektalux system is built for long reliable service without excess weight. The Flashholder is a magnesium casting; even with two batteries and the big husky press bracket, it weighs only 31 ounces. Extension units, with support clamps added, weigh only 21 ounces each. Reflectors detach with a twist of the wrist—and nest together, taking little space in the carrying case. Cords are tough and flexible, with neat, compact connectors.

The System In Brief—The Flashholder is the basic power unit—packaged all complete with the right mounting bracket for your camera (standard amateur type, press type, or Polaroid) and the right plug-in cord for your flash shutter. You need only specify what camera you use. You insert either one or two small 22½-volt batteries . . . and the Flashholder is then a complete working unit for flash shutter cameras—ready to use, no other items required.

For extension flash, you plug one or two Ektalux Extension Units into the Flashholder. Additional Extension Units can plug into these, chain-fashion. Each unit comes with one 20-foot cord.

If you want to operate your flash shutter with a solenoid, tripping it from the Flashholder, there's the Kodak Ektalux Solenoid—especially designed to operate on the quick power surge from the Ektalux battery-condenser circuit. Or, if you already have a Graflex or Heiland Solenoid, you just select an Ektalux Adapter cord with the correct terminal fittings.

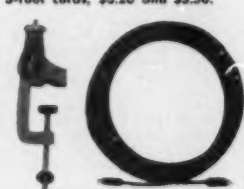
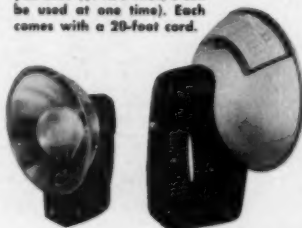
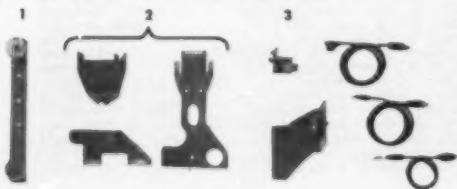
For Non-Flash Shutters—There's the Kodak Ektalux Synchro-Switch, a compact synchro-

How To Build Your Kodak Ektalux Team

A. Start with the Flashholder (above), specifying the camera you have. Flashholder comes complete with bracket and flash shutter cord. Prices: with the standard amateur bracket (1, below), \$34.75; with the instant-on, instant-off press bracket (2), \$39.50; with bracket for Polaroid camera (3), \$35.75.

B. Select as many Kodak Ektalux Extension Units as you need (\$14.50 each; 6 can be used at one time). Each comes with a 20-foot cord.

C. Extension Units stand on any flat surface, or screw on a tripod; but the most versatile supports are Kodak Extension Unit Clamps (\$3.75). Extra 20-foot cords, \$4; 3-foot cords, \$3.20 and \$3.50.



Note These Features:

Ektalux

SYSTEM

nizer which fits on the shoulder of the Flasholder. It's used with a solenoid, sets for either Class M or F lamps, and is very accurately adjustable to fit the time lag of your particular solenoid and shutter.

And for remote operation, just plug the 20-foot Remote Release cord into the Flashholder. Press the switch at the cord end, and the Flasholder trips the solenoid on your camera, 20 feet away.

Versatility Plus Quality—The Kodak Ektalux system is planned to solve any problem in photoflash lighting. The Flashholder has five inputs—for flash shutter cord, solenoid cord, two extension cords, and remote control. Extensions can be led out in one long line, or lines to either side of the camera. High-quality components are used throughout. The lamp circuit and solenoid circuit have big *separate* condensers, so that neither affects the operation of the other. A "trimming resistor" automatically switches into the lamp circuit when you detach an extension cord from the Flashholder; this protects your flash shutter from excessive power surge and arc when you are firing only one lamp—and it is typical of the carefully engineered Ektalux construction.

At right are some of the details and features of this superb flash system; below are the high-quality units that complete it. Your Kodak dealer will have additional details.

EASTMAN KODAK COMPANY, ROCHESTER 4, N.Y.

Professional quality, rugged construction, functional modern design.

Advanced battery-condenser circuit; separate condensers for lamps and solenoid provided in Flashholder.

Fires as many as 3 lamps with one 22½-volt battery; 7 lamps with two batteries.

Uses either midget or screw base lamps; quick loading and spring ejection for both types.

Midget lamps can be focused for normal spread or wide flat coverage (best for color).

Two extension outlets on Flashholder; input and output on each Extension Unit.

Extension Units do not require "booster" batteries.

"Trimming resistors" switch in automatically to protect flash shutter when extensions are NOT being used.

All lamps series-wired for perfect synchronization, no lagging.

"Open" type circuit minimizes battery drain; batteries last more than a year, thousands of flashes.

Safe circuit. Erroneous plug-in, across any Flashholder inputs, won't cause accidental firing of lamps.

Equally adaptable to solenoid or hand release; to flash shutters or exterior synchronization.

Ektalux Solenoid operates either "push" or "pull"; has extra travel for shutters with long trigger throw; is especially designed for battery-condenser operation.

Solenoid operates from release button on back of Flashholder.

High-efficiency parabolic reflectors are compact; detach instantly for packing.

Complete exposure guide for monochrome and color on back of each reflector.

Cords and fittings for every application; all contacts rhodium-plated for corrosion resistance and low electrical resistance.

Brackets to fit all leading amateur and press cameras.

Press bracket instantly detachable for holding Flashholder away from camera, on 3-foot cord.

Scientific hand-grip design for firm, easy, safe holding.

Light weight. Flashholder, 31 ounces; Extension Unit with clamp, only 21.

All units stack compactly in carrying case or bag.

D. For solenoid operation of your camera shutter, pick the Kodak Ektalux Solenoid (below, \$18); it's designed for h-c operation. Kodak Ektalux Adapters (connecting cord) are also available for Graflex and Heiland Solenoids; \$3.50 each.

E. For remote operation, with solenoid, use the Kodak Ektalux Remote Release (20-foot cord and switch, below, \$5.50). And for precision synchronized flash with solenoid-operated non-flash shutters, the Kodak Synchro-Switch (below, right, \$7.25); it fits directly on the Flashholder, adjusts for your particular solenoid.



Prices are subject to change without notice and include Federal Tax applicable when this advertisement was released for publication.

Kodak

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New KALART Invention Keeps You From Missing Flash Pictures

B-C Flash Unit with built-in test light shows — BEFORE YOU SHOOT — if flash lamps and batteries are O K

How often has this happened to you? You get set to take a flash picture — you trip the shutter — and the lamp fails to flash. You have missed your picture!

The new Kalart B-C Flash Unit eliminates the most common cause of flash failure — *weak batteries*. The flash lamps are fired not by batteries but by a tiny and powerful battery-capacitor power pack. This new superpower method of firing flash lamps shoots the current to them with a sudden wallop. It assures peak lamp performance — whether you are using one lamp, two lamps . . . or up to six lamps on long extension wires. And you can forget about replacing batteries for two years or longer.

In addition, the Kalart B-C Flash Unit is the *only flash equipment* that enables you to make sure — *before you trip the shutter* — that *every lamp* is good regardless of whether you are using single flash, two lamps or a six-lamp extension hookup.

This feature alone makes Kalart B-C Flash worth several times its cost. A leading magazine has already provided its entire staff of more than 20 photographers with Kalart B-C Units. Figure it out for yourself. A Kalart B-C Flash Unit will save so many missed pictures and wasted films that it is a positive economy to get one now. Ask your dealer for demonstration.



The light that says "OK"

Test light is located directly back of reflector — and is ready to use instantly. Simply press it down *after* inserting flash lamp. A brief flash from test light is a signal that battery and flash lamps are good.



PRICE
\$15.95
complete
including battery
and capacitor

Kalart B-C Flash Unit on Agfa Ventura. For cameras with accessory mounting shoes, Unit is supplied with correct style bracket. For other cameras, a rubber-cushioned attaching bracket that screws into tripod socket is supplied. Unit for cameras with built-in sync, \$15.95, complete.



Kalart B-C Flash Unit and one Extension Unit on reflex camera. Correct connecting cords or synchronizers are available for all types of cameras — with or without built-in sync. A Kalart B-C Flash Unit and Extension Unit cost less than many 3-cell battery flash guns alone.



Kalart B-C Flash Unit with two Extension Units. Each unit is wired in series and provided with patent-pending "Self-closing" outlets. This assures positive synchronization of 2 to 6 lamps; also permits firing only one lamp in Flash Unit when not using extension flash.

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Kalart Synchronized Range Finder
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FREE

Send for this 14-page illustrated booklet today and get the full facts on how to put an end to flash failures. THE KALART COMPANY, INC. • Plainville, Conn. Dept. PJ-12 Please send free booklet on Kalart B-C Flash Units.

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KODAK DEKTOL DEVELOPER* tops the list of favorites. An improvement over D-72 it has 20% greater print capacity, keeps 50% better, has

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EASTMAN KODAK COMPANY, Rochester 4, N. Y.

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